

# Suid-Afrikaanse Tydskrif vir Geneeskunde South African Medical Journal

Posbus 643, Kaapstad

P.O. Box 643, Cape Town

Kaapstad, 9 Maart 1957  
Weekliks 2s. 6d.

Vol. 31 No. 10

Cape Town, 9 March 1957  
Weekly 2s. 6d.

## VAN DIE REDAKSIE

### PATENTE DUCTUS ARTERIOSUS

Die uitstekende vordering met borschirurgie gedurende die afgelope dekade, het herstel gebied vir verskeie voorheen onopereerbare en fatale toestande, veral samepersing van die aorta en patente ductus arteriosus. Skaars meer as twaalf jaar gelede het Gross<sup>1</sup> 'n patente ductus arteriosus vir die eerste maal suksesvol afgebind en daardeur die tydperk van aangebore hartchirurgie ingelui en 'n behandeling-maatreël ingestel wat intussen 'n roetine operasie geword het, en teenswoordig een van die algemeenste take van die hartchirurgie uitmaak. Gedagtig hieraan, asook die wete dat kinders met patente ductus letsel onbevoeg-makende en lewensverkortende komplikasies sal ontwikkel—dit word beweer dat weinig langer as 40 jaar lewe—is vroegtydige waarneming van die toestand 'n saak van lewende praktiese belang.

Gedurende voorgeboortelike bestaan ontwyk die meerderheid van die bloed vanaf die longslagaar die longe *via* die patente ductus en gaan die aorta distaal van die oorsprong van die slagaar van die linkerondersleutelbeen binne. Normalweg sluit die ductus kort na geboorte. Indien dit oop bly en voortduur nadat die longsirkulasie in werking getree het, veroorsaak die groter druk in die aorta dat die verbindingsstroom in die teenoorgestelde rigting keer en die bloed weereens deur die longe gestuur word. Selfs tot 50% van die uitvloe van die linkerhartkamer kan op hierdie wyse afgelei word met gevolglike vermeerdering van die inspanning van die hart. Die begin van hartondoeltreffendheid is dus 'n onvermydelike gevolg; patente ductus arteriosus is al 'n tydrom met 'n baie lang lont<sup>2</sup> genoem. Diagnose bied sy eie probleme. In 'n tipiese geval is dit maklik maar die klassieke tekens is dikwels afwesig. Daar is natuurlik die 'masjinerie suigsgeluid' en voelbare trillings in die tweede tussenribruimte aan die linkerkant by 'n pasiënt wat net so wel in alle ander opsigte heeltemal gesond kan wees.

## EDITORIAL

### PATENT DUCTUS ARTERIOSUS

The splendid advances in thoracic surgery in the last decade have provided cures for several previously inoperable and fatal conditions, notably coarctation of the aorta and patent ductus arteriosus. It is scarcely more than 12 years ago that Gross<sup>1</sup> successfully ligated a patent ductus arteriosus for the first time, thereby heralding the era of congenital cardiac surgery and initiating a procedure that has become a routine operation and is today one of the commonest tasks of the cardiac surgeon.<sup>2</sup> This circumstance, together with the certainty that children with patent ductus lesions will develop crippling and life-shortening complications—few live beyond the age of 40 years, it is said<sup>3</sup>—makes early recognition of the condition a matter of vital practical importance.

During foetal life most of the blood from the pulmonary artery by-passes the lungs *via* the patent ductus to enter the aorta distally to the origin of the left subclavian artery. Normally the ductus closes soon after birth. If it remains patent and persists after the pulmonary circulation is established, the greater pressure in the aorta reverses the shunt and sends the blood once more through the lungs. As much as 50% of the left ventricle output may thus be diverted, with consequent increase in the work of the heart. Incipient cardiac failure is therefore inevitable; patent ductus arteriosus has been called 'a time bomb with a very long fuse.'<sup>2</sup> Diagnosis presents its own problems. In a typical case it is easy, but often the classical signs are absent. These are, of course, the 'machinery murmur' and thrills in the second left interspace in a patient as likely as not to be quite healthy in all other respects. But the incidence of the condition—according to

Maar die voorkoms van die toestand—volgens die lykskouingsgegevens van Maud Abbott verteenwoordig dit 10% van alle aangebore hartletsels—strek baie verder as gevalle met die „masjinerie suigeluid”. Tewens, die meerderheid gevalle openbaar waarskynlik nie hierdie kenmerk nie, wat beskryf word as deurlopend maar met sistoliese aksentuatie en maklikste hoorbaar links van die borsbeen. 'n Eenvoudige sistoliese suigeluid sonder voelbare trilling, wat onwaarskynlik gedurende latere leeftyd deurlopend sal word, is 'n algemene bevinding by ondersoek. Met teenstrydige kliniese gegevens moet toevlug geneem word tot X-straalverskynsels, die elektrokardiogram en—indien nodig—angiokardiografie. Die X-straalvoorkoms word bepaal deur die funksionele grootte van die ductus en indien dit gering is, mag die hartskaduwee heeltemal normaal voorkom. As die verbinding groot is, mag die pulmonêre konus vergroot wees (moontlik ook die regterhartkamer) en die hooflongslagare sal prominent wees. „Sonder angiokardiografie” egter „bestaan daar nie soiets soos 'n kenmerkende X-straalvoorkoms van patente ductus nie”.<sup>4</sup> Die elektrokardiogram is gewoonlik normaal; indien nie, behoort die aanwesigheid van 'n ander aangebore gebrek uitgesluit te word.<sup>3</sup>

Behoort 'n mens operasie aan te beveel in die geval waar die letsel 'n toevallige bevinding by roetine ondersoek van 'n oënskynlik gesonde kind is? Die antwoord is, beslis, ja. 'n Mens behoort, soos Blalock dit uitgedruk het „die hart te beskerm teen 'n las wat dit uiteindelik onbevoeg sal maak”. Daar bestaan weinig twyfel dat 'n ductus arteriosus wat oop bly uiteindelik die dood sal veroorsaak. Subakute bakteriële endokarditis tree gewoonlik by ongeveer 10% gevalle toe—ongeveer 25% van hierdie kinders sterf gedurende hulle suigelingsjare en weinig oorleef die middeljare, terwyl die dood gewoonlik deur hartondoeltreffendheid veroorsaak word. Pulmonêre drukverhoging mag dringende sykundige ingryping verg, want sodra die verbindingsstroom in 'n teenoorgestelde rigting gestuur word (as gevolg van die hoër druk in die longslagaar) maak die operatiewe sterftesyfer snykonde onwenslik. Afgesien van hierdie komplikasie, wat sy eie sterftesyfer inhou, is die alternatiewe operatiewe prosedure, nl. afbinding en deursny van die patente ductus arteriosus, tot 'n groot mate sonder risiko. Potts het verslag gegee van 250 opeenvolgende gevalle sonder sterfte;<sup>5</sup> tewens „die algemeenste oorsaak van rampspoed skyn verkeerde diagnose te wees”. Die operasie, wat verkieslik voor die ouderdom van 12 uitgevoer moet word, bestaan uit of die bloedvat af te bind of deur te sny. Weens die herhaalde voorkoms van funksionele herkanalisasie van die ductus, het Gross, die baanbreker van afbinding, Amerikaanse chirurge beïnvloed om dit ten gunste van algehele deursnyding te laat vaar.

Maud Abbott's post-mortem material, it represents about 10% of all congenital heart lesions—extends far beyond the cases with the 'machinery murmur'. In fact, probably the majority of cases do not exhibit this feature, described as continuous but with systolic accentuation and heard best to the left of the sternum. A common physical finding is a simple systolic murmur, unaccompanied by a thrill, and unlikely to become continuous in later life. With equivocal clinical data, recourse must be had to the X-ray appearances, the electrocardiogram and—if need be—angiocardiography. The X-ray picture depends on the functional size of the ductus and, if it is small, the cardiac shadow may appear quite normal. If the shunt is large, the pulmonary conus may be enlarged (possibly also the right ventricle) and the main pulmonary arteries will be prominent. However, 'without angiocardiography, there is no such thing as a characteristic X-ray picture of patent ductus'.<sup>4</sup> The electrocardiogram is usually normal; if it is not, the presence of some other congenital defect must be excluded.<sup>3</sup>

Should one advise operation in the case where the lesion is a chance finding on routine examination in an apparently healthy child? The answer is, definitely, yes. One should, in Blalock's words, 'protect the heart from an eventually disabling burden'. There is little doubt that a ductus arteriosus that remains patent will eventually kill the patient. In about 10% of cases subacute bacterial endocarditis supervenes; about 25% of the children die in infancy and few survive beyond middle age, death usually resulting from cardiac failure. Pulmonary hypertension may demand urgent surgical intervention, but once the shunt is reversed (as a result of the higher pressure in the pulmonary artery) the operative mortality contra-indicates surgery. Apart from this complication, which carries its own morbidity, the alternative procedures of ligation and section of the patent ductus arteriosus are largely free of risk. Potts reported on 250 consecutive cases without a death;<sup>5</sup> in fact 'the commonest cause of disaster seems to be misdiagnosis.' The operation, which is best carried out before the age of 12 years, consists of either ligating the vessel or else severing it completely. Because of the frequency of functional recanalization of the ductus, Gross, the pioneer of ligation, has led American surgeons to abandon it in favour of complete section.

1. Gross, R. E. (1944): Surg. Gynec. Obstet., **78**, 36.

2. Annotation (1956): Lancet, **2**, 1252.

3. Davidson, S. et al. (1956): *The Principles and Practice of Medicine*, 3de uitgawe, bl. 188. Edinburgh: Livingstone.

4. Shanks, S. C. en Kerley, P. (1950): *A Text-book of X-ray Diagnosis*, 2de uitgawe, vol. 2, bl. 114. Londen: H. K. Lewis.

5. Potts, W. J. (1953): Arch. Surg., **66**, 468.

1. Gross, R. E. (1944): Surg. Gynec. Obstet., **78**, 36.

2. Annotation (1956): Lancet, **2**, 1252.

3. Davidson, S. et al. (1956): *The Principles and Practice of Medicine*, 3rd ed., p. 188. Edinburgh: Livingstone.

4. Shanks, S. C. and Kerley, P. (1950): *A Text-book of X-ray Diagnosis*, 2nd ed., vol. 2, p. 114. London: H. K. Lewis.

5. Potts, W. J. (1953): Arch. Surg., **66**, 468.

The realm  
penny-tos  
matical  
average p  
the instan  
would sa  
This igno  
science is  
knowledge  
and, once  
The in  
controlled  
from this  
doctor, w  
pressions  
whose bus  
Reiss' in  
in the indi  
a patient,

In hierdie  
wat chiru  
aneurisma  
gevalle w  
chirurgies  
skillende

A.  
Geval No

'n Blanke m  
diagnose va  
Hospitaal o  
'n velheid e  
ongemak da  
yd was urin  
Op 27 Mei,  
oor die hel  
en ook om  
Hy het tege  
het tot 'n m  
Op 29 Mei  
moes gaan.  
normaal on  
opgebring e  
en net eenn  
stelsels betru  
Ondersoek  
en moeg gely  
tuur was nor  
120-80 mm.  
Buik: D

## MEDICAL STATISTICS

The realm of the statistician, with its obscure logical concepts, penny-tossing probabilities and long-out-of-mind mathematical manipulations is pardonably bewildering to the average practising clinician. What are less pardonable are the instances in which it is trespassed upon by those who would sanctify their observations with 'statistical proof'. This ignorance and abuse of an overwhelmingly valuable science is obviously regrettable. It is more so since a working knowledge of statistical method is remarkably easy to obtain and, once mastered, is of immense intellectual value.

The investigator engaged in the winnowed purity of controlled experimentation is not the only person to benefit from this knowledge. There is also a rich reward for the doctor, whose parameters are recorded in nebulous impressions rather than precise figures that 'cannot lie' and whose business is with individuals rather than populations.

Reiss<sup>1</sup> in a recent review has indicated the value of statistics in the individual patient. The clinician, when confronted with a patient, does not reject a null hypothesis to reach a diagnosis

or suggest a course of treatment. He compares that patient with his own statistical yardstick of previous experience with disease, and it is in the acquisition of this experience that statistical theory holds most for the practising doctor. No man with a knowledge of the part played by Dame Chance in the making of a diagnosis or the effecting of a cure could but be humbled by this knowledge. A mind attuned to the consideration of variables can learn a lot about its owner: Does Dr. X get better results because he uses a different preparation of digitalis or because he convinces the patients of the need for the drug more effectively than I do? Was it time that cured Mrs. Y's sore throat or the sulphonamide that I prescribed for her? If we are not plagued by questions such as these perhaps we ought to be.

Moroney,<sup>2</sup> in an excellent and eminently readable account of statistical techniques and logic, introduces the reader to the science of healthy and honest enquiry—an introduction well worth the few shillings spent on it.

1. Reiss, E. (1956): Clin. Res. Proc., 4, 225.

2. Moroney, M. J. (1956): London: Penguin Books.

## ANEURISMAS VAN DIE AORTA EN ANDER SLAGARE

J. K. BREMER, M.B., CH.B. (KAAPSTAD) F.R.C.S. (ENG.)

Pretoria

In hierdie artikel word verslag gedoen van 8 pasiënte wat chirurgiese behandeling vir arteriële of aorta-aneurismas ondergaan het. Na aanleiding van hierdie gevalle word sekere opmerkings in verband met die chirurgiese behandeling van aneurismas in die verskillende ligginge gemaak.

## A. ANEURISMAS VAN DIE AORTA

## Geval No. 1: 'Gebarste' Aneurisma van die Buikaorta

'n Blanke man, 76 jaar oud, is op 29 Mei 1956, met die voorlopige diagnose van 'n akute buiktoestand in die Pretoriase Algemene Hospitaal opgeneem. Vir die voorafgaande 8 maande was hy van 'n velheid en klopping in die buik bewus, maar het slegs af en toe ongemak daarvan gehad. Sy enigste ander klagtes gedurende die tyd was urinêre frekwensie, moeilike urinerig en disurie af en toe. Op 27 Mei, d.w.s. 2 dae voor opname, het hy skielik kwaai pyn oor die hele buik gevoel, wat aan die linkerkant die ergste was en ook om na die rug en afwaarts na die linker dy gestrek het. Hy het tegelykertyd siek en pap gevoel en het gaan lê. Die pyn het tot 'n mate verbeter, maar het op 28 Mei weer erger geword. Op 29 Mei het sy dokter daarop aangedring dat hy hospitaal toe moes gaan. Op 27 en 28 Mei het hy nie opgebring nie en hy het normaal ontlaas. Op 29 Mei het hy eenmaal donkerkleurige vog opgebring en sy buik het begin opsit. Hy het nie weer ontlaas nie en net eenmaal die oggend vroeg wind gelaat. Wat die ander stelsels betref, was daar geen simptome van belang nie.

Onderzoek. Hy het klaarblyklik baie pyn verduur en het pap en moeg gelyk. Hy het nie erg anemies voorgekom nie. Sy temperatuur was normaal en sy polsslag 90 per minuut. Sy bloeddruk was 120/80 mm. Hg.

Buik: Daar was algemene opsetting van die buik, met heel

duidelike pulsasie in die onderbuik, veral net onderkant die nael. Daar was 'n kloppende geswel omtrent 10 tot 12 sm. in deursnee met sy middelpunt net links van die nael voelbaar. Hy was erg drukgevoelig oor die grootste gedeelte van die buik, maar veral na links en ook in die linker lende. Daar was geen spierspanning nie. Enkele dermklanke kon gehoor word, maar minder as normaal. Rektale ondersoek het verhoging van die prostaat aangedui, maar geen ander afwyking nie. Daar was geen bloed op die ondersoekende vinger nie. Deur 'n maagslang wat ingesit is, is ongeveer 200 ml. bruinerige vog, wat effe sleg geruk het, afgetrek.

Die polse was in albei onderste ledemate goed voelbaar.

Onderzoek van die hart en longe het geen opvallende kliniese afwyking getoon, behalwe kreptasies by albei basisse nie.

Die kliniese diagnose van aneurisma van die buikaorta met betreklik geringe lekkasie is gemaak. Daar is besluit om hom voorlopig net te laat rus met pynstillende middels, totdat noukeuriger ondersoek van sy hart en niere gedoen kon word. Intussen is sy toestand noukeurig waargeneem. Ongeveer 3 uur later was sy algemene toestand swakker, sy polstelling het na 110 per minuut gestyg en sy bloeddruk het na 100/70 mm. Hg. gedaal. Omrede hierdie agteruitgang, is besluit om met operasie voort te gaan. Gedurende die tydperk van voorbereiding vir operasie het hy baie vinnig agteruitgegaan; hy het bleek geword, sy pols was skaars voelbaar en sy bloeddruk was 40 mm. Hg. sistolies. Die narkotiseur was selfs huiwerig om met die voorgestelde operasie voort te gaan. Die toediening van 1500 ml. bloed het egter sy toestand aansienlik verbeter sodat met die operasie voortgegaan kon word.

Die narkose is deur dr. J. E. Combrinck en dr. P. de Vaal toegedien. Omrede die betreklike haas om in die buik te kom en die bloeding te beheer, is 'n lang middellynssnit vanaf die xiphisternum tot by die pubis gemaak. By ope buik kon 'n groot aneurisma van die aorta met aansienlike retroperitoneale bloeding, veral aan die linkerkant, gesien word. Betasting van die aneurisma het getoon dat dit onderkant die niervate geleë was. Die dunderm is

in 'n plastiese sakkie geplaas en uit die pad uit gehou deur dit buite die buik uit te bring. Die duodenum is na deursnyding van die ligament van Treitz van die aneurisma losgemaak en die posterior peritoneum oor die boonste deel van die aneurisma oopgemaak om by die aorta onderkant die niervate te kom. Die aorta net bokant die aneurisma is hoofsaaklik met stomp disseksie van omliggende strukture losgemaak en met 'n Crafoord koarktasiestekel afgesluit. Kloppling in die aneurisma het opgehou en die verdere disseksie is hierdeur vergemaklik. Die takke van die aorta wat van die aneurismale deel ontspring het, naamlik lumbale arteries, arteria mesenterica inferior en albei arteriae iliacae communes, is afgebond of afgeklem en die hele sak versigtig (veral by die vena cava) verwyder. Die proksimale einde van die aorta distaal tot die Crafoord klem het werklik beroerd voorgekom; dit was veel breër as die normale en het erg ateroskleroties voorgekom; daar was verkalking in die wand, wat so bros gelyk het, dat daar gevrees is dat die klem dit onherstelbaar sou beskadig het. Die stampe van die arteriae iliacae communes waaraan die protese geheg sou moes word was albei erg ateroskleroties, en links sou dit nodig wees om feitlik deur verkalkte materiaal die hegting te doen. Om die gaping in die aorta te oorbryg was albei die aortas, wat in die bank beskikbaar was, heeltemal te nou om die proksimale uitgesette aorta te pas. Daarom is 'n protese van Ivalon spons op 'n tuisgemaakte vorm van aorta met verdeling gemaak. In sy komprimeerde toestand was die wand omtrent 4 mm. dik. Die protese is proksimaal aan die aorta geheg met 2 deurlopende hegings van 0000 Anacap arteriële sy wat gewoonweg oor-en-deur ingesit is sonder enige poging tot eversie. Nog twee versterkende hegings is veiligheidsalwe geplaas. Daarna is die twee bene van die protese aan die iliacae communes stompe op soortgelyke manier geheg. Na loslating van die klemme was enkele bykomstige steke nodig om bloeding te beheer, meestal by die distale anastomoses. Die protese wat in die begin 'n bietjie bloed 'gesweet' het, het gou droog geword. Die arteriae iliacae externae het goed geklop. Die plan was om met sluiting van die buik te begin, toe daar opgeleë is dat die protese self begin uitsit en aneurismaal word, en weer deur sy eie gaatjies begin te lek. Die proksimale Crafoord klem is weer toegepas, en 'n dubbele laag Orlon, wat gelukkig beskikbaar was, is om die protese gewikkel en daar vasgewerk. Daarna het dit nie verder uitgesit of geleek nie. Die buik is sonder dreinerings gesluit. Die operasie wat ongeveer 7 uur geduur het, is deur die pasiënt goed verdra. Aan die einde daarvan kon albei femorale polse goed gevoel word, maar geen voetpols was waarneembaar nie en die bene het taamlik bleek gelyk.

Die gewone na-operatiewe behandeling vir 'n groot buikoperasie is tesame met redelike groot dosisse antibiotika gegee. Na 24 uur was die kleur van die regterbeen goed en die bewegings normaal. Die linkerbeen was nog maar bleek en koud, en dorsifleksie was baie swak, maar sensasie taamlik goed. Agt-en-veertig uur na operasie kon die dorsalis pedis pols regs gevoel word. Links was die kleur van die voet nou normaal en die bewegings baie verbeter, maar geen polse was voelbaar nie. Geleidelike verbetering in sy algemene toestand en in die gebruik van die bene het plaasgevind, sodat hy 2½ weke na operasie ontslaan kon word. Op hierdie tydstryd kon geen polse links gevoel word nie. Vandat hy opgestaan het, het die linkerbeen matig geswel, vermoedelik as gevolg van diep veneuse trombose. Hy is 3 maande na operasie weer gesien en het toe vir sy ouderdom baie goed gevoel. Die bloedsomloop was in albei bene heeltemal redelik, hoewel geen polse links voelbaar was nie, en regs net die dorsalis pedis geklop het. Die linker onderbeen het nog 'n bietjie geswel, maar so min dat hy eintlik die aanbevole Crepe verbande nie meer gebruik het nie.

#### Opmerkings

1. Dit word nou besef dat nadat die diagnose van lekkende aorta-aneurisma gemaak is, daar geen regverdige vir 'n afwagende houding was nie. Al word dit vermoed dat die lekkasie gering is, behoort operasie so gou moontlik gedoen te word, omdat verdere vinnige lekkasie met noodlottige gevolge kan plaasvind.

2. Die toegang deur 'n lang middellyn snit was goed, maar 'n lang linker paramediane snit sou beter wees omdat dit 'n stewiger wond aan die einde van die operasie sou laat. Dit moet beklemtoon word dat feitlik elke sentimeter van die lang wond van xiphisternum na pubis nodig is vir 'n redelik gemaklike en veilige operasie op hierdie deel van die aorta.

3. Dit was interessant om te ondervind dat, ten spyte van die

werklik skrikwekkende voorkoms van die aortastomp en van die iliacae communis-stompe, 'n digte hegting aan die vervangende protese moontlik was.

4. Dit was 'n onaangename skok om te vind dat die Ivalon protese, wat andersins heeltemal bevredigend was, na 'n rukkie aneurismaal begin word het. Hierdie moeilikheid behoort maklik uit die weg geruim te kan word deur die protesevrand dikker te maak, of moontlik deur 'n laag Orlon tussen die lae Ivalon in te las, en in elk geval deur Orlon of soortgelyke plastiese materiaal beskikbaar te hê vir versterking van die Ivalon protese indien nodig.

5. Die gewone tekens van goeie bloedsomloop het nie onmiddellik na operasie verskyn nie, maar in die linkerbeen eers na 48 uur. Die pols in die regtervoet het eers na sowat 24 uur voelbaar geword. Die verklaring vir hierdie vertraagde terugkeer van sirkulasie moet moontlik in vaatspasme gesoek word.

6. Waarom die polse in die linkervoet nooit teruggekeer het nie, terwyl die arteria femoralis links goed geklop het, is ook nie heeltemal duidelik nie. Moontlik kon trombi van die aneurismasak losgegaan het en die meer distale slagare verstopt het, of daar kon moontlik spontane trombose in hierdie distale slagare plaasgevind het, onderwyl die bloedsomloop gedurende die operasie afgesnoer was. Om hierdie moontlikhede te probeer voorkom, sou dit wenslik wees om na proksimale afklemming van die aorta bokant die aneurisma, eers die arteriae iliacae communes af te klem voordat verdere disseksie en manipulasie van die aneurismasak plaasvind. Verder sou dit wenslik wees om 20 ml. verdunde Heparinoplossing distaal in elke iliacae communis te spuit om spontane trombose te probeer voorkom.

#### Geval No. 2: 'Gebarste' Aneurisma van die Buikaorta

'n Bantoe man, 45 jaar oud, is op 11 Augustus 1956, in die Pretoriase Algemene Hospitaal opgeneem met 'n vermoede akute buiktoestand. Sy siektegeskiedenis was betreklik vaag en onseker. Dit blyk dat hy ongeveer 5 weke voor opname siek gevoel het en buikpyn gehad het, wat so erg was, dat hy opgehou werk het en by die huis gaan lê het. Sy buik het opgesit en hy kon nie spontaan ontlaas nie, maar het tog wel met purgeermiddels ontlastings gehad. Die buikpyn het kort voor opname vinnig toegeneem met die gevolg dat hy hospitaal-toe gekom het. Hy het geen ander klages van direkte belang gehad nie. Op noukeuriger ondervraging omtrent sy vorige geskiedenis meld hy dat hy 'n paar jaar gelede oor 'n tydperk van verskeie weke binne-aarse en binnespiersie inspuittings gehad het (vermoedelik vir lues).

Ondersoek. Hy het siek gelyk. Temperatuur was 98.8 F., pols 90 per minuut en asemhaling normaal. Hy het anemies voorgekom. Die buik was opgesit, daar was matige spierspanning, veral links, en 'n vaagomlynde massa is in die linker onderbuik gevoel. Geen duidelike pulsasie is gevoel nie. Rektale ondersoek het geen afwyking getoon nie. Ondersoek van ander dele van die liggaam het niks bygedra nie.

Die kliniese indruk was dat daar 'n inflammatoriese massa in die linker onderbuik was. Sistoskopiese ondersoek het nie veel bygedra nie, want die linker ureter kon nie kateteriseer word nie. Barium kliesma het geen dermafwyking getoon nie. Terwyl sy algemene toestand agteruitgegaan het, is op 12 Augustus 1956 tot laparotomie besluit.

Onder algemene narkose deur dr. van der Berg is die buik deur 'n linker paramediane snit oopgemaak. 'n Taamlike groot aneurisma van die buikaorta met 'n groot retroperitoneale hematoom, veral aan die linkerkant van die buik, is gevind. Geen intraperitoneale afwyking is gevind nie, behalwe aansienlike uitsetting van beide dikderm en dunderm, waarvoor geen meganiese of inflammatoriese oorsaak gevind is nie. Die linker paramediane snit is verleng tot by die xiphisternum bo en die pubis onder, en die dunderm in 'n plastiese sakkie geplaas en oor die regterkant van die buik uitgebring om alle moontlike ruimte binne die buik beskikbaar te maak. Daar is toe gevind dat die aneurisma omtrent 8 tot 10 sm. in deursnee was en gestrek het van onderkant die niervate tot net by die aorta-afdeling. Aan die linkerkant van die buik was daar 'n uitgebreide retroperitoneale kloppende hematoom wat die hele linker fossa iliaca volgemaak het en opwaarts feitlik tot by die linker nier gestrek het. Geen poging is op hierdie stadium aangewend om die lekkasie van die aneurisma te beheer nie, omdat sulke pogings tog maar gewoonlik vrugtelos is, en omdat die lekkasie nie op die oomblik erg was nie. Die ligament van Treitz is losgemaak en die duodenum na regs weggetrek. Die posterior

peritoneu  
ooggema  
aorta te  
verplaas  
niervate  
op 200  
sodat  
stolling  
nou ond  
arteries  
deurklief  
maak.  
wat gevir  
daar is ge  
'n Homo  
die gewy  
beskryf, f  
plantaat,  
is onder  
op die ge  
geen teke  
effe skuin  
Hy het  
Aan die e  
maar reg  
Na 24  
albei voe  
dosisse a  
effe bloe  
linker ver  
traag deu  
na opera  
was geen  
nie.

#### Opmerkinge

1. Die  
lues, 'n  
buikaorta  
jaar), die  
aorta bok  
geskiedenis  
Die Kolt  
2. Uit  
die aneur  
van die  
Dit is wel  
lek sonde  
Dit bekle  
ma gald  
daar baie

#### Geval

'n 62-jari  
Snyman g  
bygaande  
het 'n bu  
vraging o  
sowat 2½  
koeksoda  
toegeskry  
Hy was v  
het matig  
symptome  
uriniere kl  
die bloe  
Onderso  
wat nie a  
groot kle  
buik geto  
xiphistern  
dit tot op  
regs, tot  
nael waar  
Dit was t  
grense du



peritoneum bokant die aneurisma en onderkant die niervate is ooggemaak en die disseksie in die diepte voortgesit om om die aorta te kom. Die aorta was a.g.v. kronkeling heelwat na regs verplaas. Dit is met 'n Crafoord koarktasieklem onderkant die niervate afgeklem. Twintig ml. verdunde Heparin (5000 eenhede op 200 ml. normale soutoplossing) is in die aneurisma gespuut sodat dit ook afwaarts in die ledemate sou versprei en distale stolling sou voorkom. Die onderste einde van die aneurisma is nou ondersoek, die ureters weggestoot en die iliaca communis arteries afgeklem. Die arteria mesenterica inferior is afgebind en deurklief. Die sak is ooggemaak om verwydering geriefliker te maak. Daar was nog matige bloeding vanaf die lumbale arteries wat gevind en afgebind is. Die sak is toe volledig verwyder en daar is gevind dat die verdeling van die aorta net gespaar kon bly. 'n Homotransplantaat ('n stuk torakale aorta wat vir 9 dae in die gewysigde weefselkweekingsmedium, soos deur Gross e.a. beskryf, bewaar is) is deur 'n assistent gereed gemaak. Die transplantaat, wat omtrent 6 sm. lank was voordat dit uitgereek was, is onder aansienlike spanning (om latere kronkeling te voorkom) op die gewone manier ingeplant. Die proksimale aortastomp het geen tekens van aterosklerose getoon nie. Die distale stomp was effe skuins en die transplantaat moes ooreenkomstig gesny word.

Hy het die operasie wat 7 uur lank geduur het, goed verdra. Aan die einde daarvan kon die polse in die linkervoet gevoel word, maar regs was die voetspolse nie duidelik waarneembaar nie.

Na 24 uur was die sirkulasie in albei voete goed en het polse in albei voete geklop. Die na-operatiewe behandeling het redelike dosisse antibiotika ingesluit. Vir 2 dae na operasie was sy uriën effe bloederig, moontlik a.g.v. langdurige kompressie van die linker vena renalis gedurende operasie. Sy finale herstel is vertraag deur 'n sakrale drukseer wat traag genees het. Twee maande na operasie het die polse in sy voete nog goed geklop en daar was geen teken van aneurismale uitsetting van die transplantaat nie.

#### Opmerkings

1. Die oorsaak van die aneurisma in sy geval was waarskynlik lues, 'n ietwat buitengewone oorsaak van aneurisma van die buikaorta. Ten gunste van hierdie etiologie is sy ouderdom (45 jaar), die afwesigheid van aterosklerotiese veranderinge in die aorta bokant en die iliaca vate onderkant die aneurisma, en die geskiedenis van inspuitsings oor 'n tydperk van 'n paar maande. Die Kolmer en Price reaksies is op die oomblik negatief.

2. Uit die siektageskiedenis is dit onduidelik presies hoe lank die aneurisma geleë het, maar dit is tog waarskynlik dat die begin van die lekkasie reeds 5 weke voor opname plaasgevind het. Dit is wel buitengewoon dat 'n aneurisma oor so 'n lang tydperk lek sonder om die dood te veroorsaak, maar tog nie onbekend nie. Dit beklemtoon in elk geval die feit dat lekkasie van so 'n aneurisma gald nie noodwendig onmiddellik noodlottig is nie, en dat daar baie dikwels tyd genoeg is om operatief in te gryp.

#### Geval No. 3: Aneurisma van die Buikaorta

'n 62-jarige blanke man is deur dr. W. H. Davis en prof. H. W. Snyman gesien omdat hy enkele aanvalle van duiseligheid en verbygaande bewussynsvermindering gehad het. Roetiene ondersoek het 'n buikaorta-aneurisma aan die lig gebring. Nadere ondervraging omtrent buikklagtes het die inligting opgelewer dat hy sowat 2 jaar vroeër aan bobuikpyn gely het, waarvoor hy baie koeksoda gebruik het omdat hy die pyn aan slegte spysvertering toegeskryf het. Hierdie pyn was nie voortdurend teenwoordig nie. Hy was vir 'n paar maande al bewus van 'n volheid in die buik en van drukegevoeligheid aan die linkerkant bokant die nael. Hy het matige las gehad van pyn in die kruis. Hy het geen uitgesproke simptome van angina of van hartversaking gehad nie, en ook geen urinêre klagtes nie. Daar was geen simptome van inkorting van die bloedsomloop in die ledemate nie.

**Ondersoek.** Hy was 'n matig gesette en breedgeboude man wat nie akute siek gelyk het nie. Ondersoek van die buik het 'n groot kloppende geswel hoofsaaklik in die linkerkant van die buik getoon. Dit het gestrek van omtrent 3 sm. onderkant die xiphisternum tot omtrent 3 sm. onderkant die nael. Na links het dit tot omtrent 7 sm. lateraal van die middellyn gestrek en na regs, tot 1 of 2 sm. regs van die middellyn, behalwe onderkant die nael waar dit omtrent 3 sm. regs van die middellyn gestrek het. Dit was taamlik drukegevoelig en dit was gevolglik moeilik om die grense duidelik te voel, behalwe toe hy onder narkose was vir die

aortogram. Geen geruis kon gehoor word nie. Geen ander afwyking van belang is in die buik gevind nie. Ondersoek van die onderste ledemate het geen sirkulatoriese afwyking getoon nie en al die polse het goed geklop. Kliniese en elektrokardiografiese ondersoek van die hart het geen afwyking getoon nie. Ondersoek van die senuweestelsel het geen afwyking opgelewer nie. Die ander tasbare slagare het nie opvallend sklerotiese gevoel nie. Die sigbare vate in die fundus van die oog het graad 1 tot 2 arteriosklerotiese veranderinge getoon. Geen urinêre afwyking is gevind nie.

Die kliniese diagnose van aterosklerotiese aneurisma van die buikaorta is gemaak.

Oorsigsfoto van die buik het 'n goedomlynde skaduwee aan die linkerkant van die buik getoon. Die boonste deel daarvan het oor die onderste derde van die linker nier gelê. Omrede van die hoë ligging van die boonste einde van die aneurisma is besluit om 'n aortogram te doen om die verhouding tot die nierslagare aan te toon. Dit het gewys dat die aorta onmiddellik onderkant die niervate skerp na links gekronkel het, en dat die aneurisma hiervandaan opwaarts oor die onderste deel van die linker nier gestrek het. Die piëlogram na die aortogram het goeie nierfunksie aan albei kante aangedui.

Na sorgvuldige oorweging is besluit om ten spyte van die feit dat hy min simptome gehad het, wat met sekerheid aan die aneurisma toegeskryf kon word, operasie aan te beveel, omdat die aneurisma so groot was (omtrek 12 by 8 sm.) en drukegevoelig was, en omdat hy andersins nie uitgesproke tekens van ernstige siekte gehad het nie en nog maar 62 jaar oud was.

Operasie is op 9 November 1956, onder algemene narkose deur drs. van Rensburg, Uys en Wessels, gedoen. Ureterkateters is deur dr. T. P. S. MacDonald ingesit om met die uitkenning van die ureters te help. Die gewone lang linker paramediane snit van xiphisternum tot pubis is vir toegang gebruik. Die dunderm is in 'n plastiese sakkie gepak en oor die regter kant van die buikwond uitgehou. Die ligament van Treitz is losgemaak en die duodenum, wat aan die regterkant van die aneurisma erg verkleef was, moes losgesny word. Soos verwag, was die boonste einde van die aneurisma aan die linkerkant baie hoog op in die buik. Die vena mesenterica inferior was aan die linkerkant van die aneurisma verkleef en waarskynlik al tromboseer. Met die losmaak is dit sonder opvallende bloeding afgesny sonder dat daar besef is dat dit in die fibrotiese massa ingesluit was. Die onderste einde van die aneurisma het die verdeling van die aorta ingesluit. Die posterior peritoneum onmiddellik onderkant die mesocolon transversum is ooggemaak en die vena cava, vena renalis sinistra en sy vena testicularis tak gevind. Laasgenoemde is tussen onderbindings deurklief om die vena renalis meer beweeglik te maak. Die aorta bokant die aneurisma is met groot moeite, hoofsaaklik met blinde disseksie met die vinger, omsingel en 'n kateter daarom geplaas om dit te kan presenter om 'n Crafoord koarktasie klem daarop te plaas. Die arteriae iliaca communes is daarop gevind, afgeklem, deurklief en distaal met 20 ml. verdunde Heparinoplossing aan elke kant ingespuut. Terwyl dit gelyk het of die disseksie van die aneurisma in hierdie geval van die onderkant af makliker sou wees, is dit dan ook van onder af na bo gedoen. Dit was links erg verkleef aan die vena mesenterica inferior, en regs aan die vena cava inferior, en by laasgenoemde is 'n nou strokie sakwand gelaat. Die arteria mesenterica inferior en omtrent 3 lumbale arteries is afgebind. Die gaping na verwydering van die aangetaste deel van die aorta is oorbrug met 'n homotransplantaat van aorta met verdeling, wat vir 8 dae in Gross weefselkweekingsmedium bewaar is. Na plasing van die transplantaat is die klemme, wat vir ongeveer 3½ uur op was, losgelaat. Daar was matige kwaai bloeding van die gebied van die boonste anastomose wat gebyk het van 'n lumbale arterie net bokant die transplantaat te kom, vermoedelik vanaf die deel van die aorta waarop die klem self was. Dit is met moeite omsteek en daarna was al die anastomoses droog. Die femorale slagare het goed geklop. Daar was geen noemenswaardige daling in die bloeddruk na loslating van die klem nie. Die colon sigmoideum is noukeurig ondersoek omrede die deurkliewing van die vena mesenterica inferior, wat taamlik styf vol bloed gevoel het, maar nie tromboseer was nie. Die kleur was normaal en daar was geen tekens van veneuse stuwung van die dikderm nie. Na sluiting van die posterior peritoneum is die buik op die gewone manier sonder dreinerings gesluit.

Aan die einde van die operasie kon die voetspolse nie gevoel word nie en die voete was bleek en koud. Hy het die operasie andersins goed verdra.

Na 24 uur was die kleur en sensasie van die linkervoet bevredigend hoewel geen polse in die voet gevoel kon word nie. Die regtervoet was gevoelloos en bleek in sy distale kwart en geen voetpolse kon gevoel word nie. Albei femorales het goed geklop. Sy urine was taamlik bloedbevlek. Sy algemene toestand was goed.

Na omtrent 40 uur was die kleur van die distale kwart van die regtervoet minder bleek maar taamlik blou en geen polse was in die voete voelbaar nie. Intra-arteriële Prisol (10 mgm.) het tydelike verbetering in die kleur van die voet veroorsaak. Sy algemene toestand was goed. Hy het reeds flatus gelaat en die maagslang is verwyder.

Na omtrent 48 uur het hy van benoudheid gekla en 'n bietjie sianoties geword en sy pols het van 100 na 140 per minuut gestyg. Ondersoek het verminderde lugtoegang na die linkerlong getoon. Bronchoskopie het net geringe tydelike verbetering meegebring. Elektrokardiogram het geen baie opvallende afwyking getoon nie, behalwe rotasie van die hart. Sy bloeddruk was in die omgewing van 120/70. Die diagnose was nie heeltemal duidelik nie. Ten spyte van toepassing van die gebruikelike maatreëls, het hy meer sianoties en kortasemig geword en uiteindelik omtrent 60 uur na die operasie gesterf. Dit was nie heeltemal duidelik presies wat die dood veroorsaak het nie. Atelektase van die linkerlong, pulmonale embolie en infarksie van die hart is oorweeg, maar teen elk kon gewigtige beware ingebring word. Die eindbeeld was nie dié van bloeding nie, en daar was geen aanduiding van intra-abdominale verwikkelinge nie. Lykskouing is nie gedoen nie.

#### Opmerkings

1. Die moeilike besluit moes hier gemaak word of 'n betreklik asimptomatiese aneurisma opereer moes word of nie.

2. Die gebruik van ureterkateters mag oorbodig klink, maar waar die aneurisma aan omliggende strukture erg verkleef kan wees, is dit soms moeilik om strukture uit te ken. My persoonlike gevoel is dat mens jou anatomiese trots in jou sak moet steek en die veiligste beleid moet volg.

3. Hoewel die oorsaak van die vertraagde terugkeer van die bloedsomloop in die bene nie met sekerheid vasgestel is nie, lyk dit meer waarskynlik dat dit die gevolg is van vaatspasme as van embolie. Verder is dit waarskynlik dat hierdie vaatspasme die gevolg is van te lange afsluiting van die bloedsomloop na die onderste ledemate. In hierdie geval was die afsluiting weens tegniese moeilikhede by die verwydering van die aneurisma besonder lank, naamlik 3½ uur. Die gedagte ontstaan of dit nie in gevalle, waar so 'n lang afsnoering weens tegniese moeilikhede onvermydelik is, wenslik sal wees om 'n tydelike omleiding, bv. met 'n politeenbuis vanaf die arteria lialis, te gebruik nie.

4. Die moontlikheid van besering van die vena mesenterica inferior moet in gedagte gehou word, hoewel dit selde 'n groot gevaar is.

5. Die moontlikheid van noodlottige komplikasies in ander stelsels, ten spyte van 'n tegniese bevredigende voltooiing van die operasie, word deur die pasiënt se dood beklemtoon.

#### Geval No. 4: Aneurisma van die Torakale Aorta

'n Bantoevrou ongeveer 50 jaar oud, is in die Pretoriase Algemene Hospitaal opgeneem, met die volgende klagtes: kortasemigheid met oefening en wanneer sy plat lê, veral as haar kop en nek agteroor gebuig is; geringe hoës, wat maar min slym uitbring; betreklik geringe pyn in die boonste deel van die toraks; en 'n geswel in die onderste deel van die regterkant van die nek. Die duur van die klagtes was 'n paar maande, en hulle het geleidelik erger geword.

**Ondersoek.** Sy het regop in die bed gesit sonder kortasemigheid. As sy plat lê en veral met die kop agteroor, het sy van benoudheid gekla. In die regterkant van die nek, net bokant die mediale helfte van die clavicula, was 'n kloppende geswel sigbaar. Met betasting is vasgestel dat dit gestrek het van ongeveer 5 sm. regs van die middellyn tot 2 sm. links van die middellyn, en omtrent 4 sm. opwaarts in die nek. Geen trilling was voelbaar en geen geruis hoorbaar oor die geswel nie. Albei arteriae carotis communes was in die nek voelbaar. Die trachea was na regs verplaas. Die radialis polse was goed voelbaar en gelyk. Die arteriële bloeddruk was 130/60 mm. Hg. in albei arms.

Daar was geringe hartvergroting en 'n blasende sistoliese en diastoliese geruis oor die aortaklep en pulmonale klep gebiede. Die longe het klinies geen afwyking getoon nie. Terwyl haar stem soms hees geklink het, is die stembande ondersoek. Albei het

beweg. Ondersoek van die buik het geen aneurisma of ander afwyking opgelewer nie.

Die kliniese diagnose was 'n aneurisma waarskynlik van die arteria anonyma of van die aortaboog self.

**Röntgen-ondersoek.** Daar was 'n skaduwee agter die manubrium sterni, wat ook op die vooropname net regs daarvan gesien kon word. Die trachea was na regs verplaas. Die esofagus was sentraal geleë. Daar was 'n halsrib regs. 'n Posing om 'n torakale aortogram vanaf die regter arteria radialis te doen, het misluk omdat die kateter in 'n kinkel van die regter arteria subclavia bly vasstet het. Die kontrasmiddel is tog ingespuut, maar alleenlik die nekslagare was sigbaar.

EKG het tekens van geringe linker ventrikulêre ischemie getoon. Die Kolmer reaksie was sterk positief.

Die diagnose was dus luetiese aneurisma van die arteria anonyma of aorta of albei. Operasie is aanbeveel en is voorafgegaan deur behandeling van die luetiese toestand, en asemhalingsoefeninge.

Operasie is op 6 Junie 1956, onder algemene narkose deur dr. J. E. Combrinck, gedoen. Die pasiënt het op haar rug gelê en die hele nek en toraks is afgedek. Die nek is deur 'n dwarssnit soos vir kropoperasies oopgemaak, en die geswel ondersoek. Dit het bestaan uit die boonste deel van 'n aneurisma wat vanuit die toraks gekom het en tot by die verdeling van die arteria anonyma in carotis en subclavia takke gestrek het. Om die gevaar van inkorting van serebrale sirkulasie gedurende en na verwydering van die aneurisma te voorkom, is 'n arteriële homotransplantaat tussen die linker arteria subclavia en die regter arteria carotis communis ingelas. Gedurende die plasing van die transplantaat is die carotis communis met 'n geboë Potts ductus klem net gedeeltelik afgeklem, sodat die bloedsomloop na die regterkant van die harsings net ingekort is, maar nie tot stilstand gebring is nie. Voordat verdere disseksie om of manipulasie van die aneurisma gedoen is, is die boonste einde van die aneurisma net onmiddellik voor die verdeling van die anonyma afgeklem, om te voorkom dat trombi losgaan en na die harsings meegevoer word. Die arteria carotis communis en die arteria subclavia het nog goed geklop omdat bloed van die linker subclavia deur die transplantaat na regs gevloei het.

Die toraks is nou deur 'n snit in die tweede tussenribruimte tot in die middellyn van die sternum oopgemaak. Hiervandaan is die sternum vertikaal opwaarts tot in die nek gesplits. Die aneurisma is blootgelê en gevind 'n anonyma-aneurisma te wees wat tot aan die aorta strek. Die basis van die aneurisma by sy oorsprong vanaf die toraks was omtrent 4½ sm. lank. Dit moet eintlik as 'n gesamentlike aorta-anonyma-aneurisma beskou word. Nadat die vena anonyma sinistra tussen onderbindings deuresny is, is die basis van die aneurisma losdissekteer en 'n spesiale klem skuins oor die deel van die aorta vanwaar die aneurisma ontspring het, geplaas. Die aneurismasak is verwyder en laterale herstel van die aorta gedoen met twee rye onderbroke 0000 arteriële sy op kort reguit naalde. Gevaarlike bloeding vanaf die linker einde van die gehegte deel van die aorta kon met behulp van 'n stuk polivinyl alkohol spons gestelp word. Die wonde is gesluit met dreinerings van die regter pleuraholte. Haar toestand aan die einde van die operasie was redelik goed.

Behalwe die gewone na-operatiewe behandeling is sy ook redelike groot dosisse antibiotika toegedien. Na omtrent 48 uur het atelektase van die linkerlong ontstaan en bronchoskopiese aspirasie is gedoen om uitsetting van die long aan te help. Haar toestand het geleidelik verbeter en na omtrent 'n week was dit redelik. Toe het sy agteruit begin gaan en 'n seropurulente afskeiding het uit die nekwond verskyn. Op die elfde na-operatiewe dag is sy dood. By lykskouing is gevind dat daar uitgebreide septiese mediastinitis was, wat die dood veroorsaak het. Die aortahegtings was ongeskonde en daar was geen lekkasie nie. Die transplantaat was nog oop sonder trombose.

#### Opmerkings

1. Die aansienlike verplasing van die trachea na regs deur 'n anonyma-aneurisma was onverwags.

2. Die operatiewe bevindings en die onmiddellike na-operatiewe verloop in hierdie geval bevestig die mening van verskeie pioniers op hierdie gebied dat eksisie van 'n sakvormige aneurisma van die aorta met laterale herstel prakties is. Ten spyte van die luetiese aandoening, is die wand van die aorta taai genoeg om die steke te hou.

3. 'n Transplantaat vanaf die linker arteria subclavia na die regter arteria carotis communis het in hierdie geval goed gewerk.

en kan waarskynlik beskou word as 'n redelike metode om ten minste tydelik die bloedsomloop na die harsings aan die gang te hou. Of hierdie transplantaat in hierdie bepaalde geval werklik nodig was, val te betwyfel. Verskeie gevalle van blote eksisie van so 'n aneurisma sonder enige poging om die bloedsomloop in die carotis te herstel is al beskryf, en in die meeste van hulle was die bloedsomloop deur die kollaterale takke voldoende. Daar is egter ook minstens een geval beskryf waar hemiplegie gevolg het.<sup>1</sup> Waarskynlik sal dit raadsaam wees om na afklemming van die distale einde van die arteria anonyma die bloeddruk in die arteria carotis communis te meet, en daarvolgens gelei te word of 'n transplantaat nodig sal wees, of nie.

4. Die ontstaan van noodlottige mediastinitis, ten spyte van die gebruik van antibiotika, beklemtoon die noodsaaklikheid van besonder strengte maatreëls teen besmetting gedurende en na hierdie lang operasies.

#### Geval No. 5: Aneurisma van die Aortaboog

'n Blanke vrou, 47 jaar oud, is op 12 Junie 1956, in die Algemene Hospitaal, Pretoria, opgeneem met die volgende klagtes: Benoudheid en kortasemigheid, wat uitgelok is deur oefening, opgewondenheid, en deur plat te lê; 'n kloppende geswel in die middel van die nek net bokant die sternum; en 'n geringe hoë sonder sputum. Sy het geen pyn en geen slukbesware gehad nie. Die simptome het verskeie maande vroeër begin en geleidelik toegeneem.

Onderzoek. Terwyl sy regop gesit het, was sy nie benoud of kortasemig nie maar, as sy plat lê en veral as die kop en nek agteroor lê, het sy van benoudheid gekla en kortasemig geword.

Met ondersoek van die nek is 'n kloppende geswel ongeveer 4 cm. in deursnee in die middel van die nek net bokant die sternum gevind. Duidelike kloppende beweging van die hele regter sternoklavikulêre gebied kon gesien word. Geen trilling was oor die geswel of elders voelbaar nie. Die arteriae carotis communis kon aan albei kante gevoel word. Die trachea was betreklik sentraal geleë. In die gebied net onderkant die linker clavicula was die oppervlakkige venae meer opvallend as aan die regterkant. Albei armpolse was voelbaar en gelyk en die arteriële bloeddruk was 140/80 mm. Hg. in albei arms. Onderzoek van die toraks het hipoplasie van die linker mamma getoon, maar geen verdere afwyking nie. Daar was geen aortaklep inkompentensie of ander hartafwyking nie. Die longe was klinies normaal. Buik-onderzoek het geen afwyking opgelewer nie en in die besonder, geen aneurisma van die buikaorta nie.

Die kliniese diagnose was aneurisma van die aortaboog, waarskynlik van luetiese oorsprong.

Röntgenologiese ondersoek het 'n groot aneurisma in die gebied tussen die aortaboog en die regter sternoklavikulêre gewrig getoon. Daar was erosie van die manubrium en van die mediale einde van die regter clavicula. Die trachea was sentraal geleë maar van voor na agter vernou. Die hart het normaal voorgekom. Aortogram is nie gedoen nie, omdat daar gevoel is dat selfs met goeie vulling daar weens die grootte van die aneurisma waarskynlik geen helderheid verkry sou word oor die presiese oorsprong en verbindings daarvan nie.

Die Kolmer reaksie was sterk positief.

EKG het geen noemenswaardige hartafwyking getoon nie.

Operasie is aanbeveel en voorafgegaan deur behandeling van die luetiese toestand en asemhalingsoefeninge.

Operasie is op 10 Julie 1956, onder algemene narkose deur drs. B. J. van Rensburg en P. de Vaal, gedoen. Die pasiënt het op haar rug geleë met haar kop deur 'n sandsak 'n bietjie vorentoe gelig, omdat agteroorbuiging 'n duidelike toename in die obstruksie van haar lugweë veroorsaak het. Die nek is deur die gewone kropsnit ooggemaak. Die arteria carotis communis is gevind en afwaarts gevolg. Dit het agter die aneurismale massa afwaarts geloop en tot so ver as wat met vingerdisseksie bereik kon word, kon geen verband met die aneurismale massa gevind word nie. Daar is dus op hierdie stadium geen transplantaat ingesit om die sirkulasie van links na regs oor te bring soos in geval No. 4 nie.

Die toraks is deur 'n dwarsnit deur die sternum en albei tweede tussenribruimtes ooggemaak en albei pleuraholtes is binnegegaan. 'n Geweldige groot aneurisma, waarvan die basis vanaf die aortaboog minstens 7 cm. lank was, is gevind. Die hele omvang van die basis vanaf die aorta kon nie bygekomp word nie, en dit is onseker presies wat die verhouding tot die groot takke van die aorta was. Alleenlik die linker arteria subclavia kon gevind word en dit was deur die aneurisma erg na links verplaas. Die arteria anonyma en die arteria carotis communis sinistra het waarskynlik van die

agterkant van die aneurisma of vanaf die aorta agter die aneurisma ontspring. Na boontoe het die aneurisma tot in die nek gestrek. Voor was dit heeltemal vas aan die sternum. Agter het dit kwaai druk op die trachea uitgeoefen, wat hier feitlik platgedruk was. Omrede die geweldige lengte en breedte van die basis van die aneurisma, het dit nie prakties gelyk om die basis met 'n klem af te snoer en laterale herstel te doen nie. Dit is derhalwe as onopereerbaar beskou. Nadat 'n dreineringsbuis in elke pleuraholte geplaas is, is die wonde gesluit. Met verwydering van die intra-tracheale buis aan die einde van die operasie het die pasiënt dadelik moeilik asemgehaal, en moes die buis teruggeplaas word. Eers na omtrent 24 uur is dit heeltemal uitgehaal. Daarna was intra-tracheale aspirasie nog eenmaal nodig. Sy is in 'n suurstof tent gehou en na sowat 3 dae het sy weer redelik asemgehaal. Hoewel sy self beter gevoel het, was haar toestand sowat 6 weke later feitlik dieselfde as voor operasie.

#### Opmerkings

Dit is miskien moontlik dat vervanging van die hele aortaboog met gebruik van omleiding in hierdie geval oorweeg kan word, indien haar simptome lewensgevaarlik word.

#### BESPREKING VAN BEHANDELING VAN AORTA-ANEURISMAS

Ten spyte van sporadiese pogings van chirurgie in verskillende dele van die wêreld gedurende die afgelope 50 jaar om aorta-aneurismas operatief te behandel, is hulle tot betreklik onlangs deur die geneeskundige beroep as buite bereik van operatiewe behandeling beskou. In die afgelope 10 jaar is indirekte operatiewe metodes, soos die gebruik van groot hoeveelhede fyn draad in die aneurisma om stolling te veroorsaak (veral deur Blakemore op die voorgrond gestel), en die gebruik van fibroplastiese stowwe om die aneurismawand van buite af te versterk, op die proef gestel, maar weens betreklike swak resultate, vervang deur direkte operasies vir verwydering van die aneurisma. Met die groot vordering op die gebied van die vaatchirurgie in die afgelope jare het dit moontlik geword om die verwyderde aneurisma met groot welslae met arteriële transplantate of plastiese prosteses te vervang. 'n Kort oorsig oor die moontlikhede van hierdie direkte operatiewe ingrepe

TABEL I

	<i>Aneurisma van Torakale Aorta</i>	<i>Aneurisma van Abdominale Aorta</i>
Etiologie	Gewoonlik lueties. Soms ateroskleroties. Selds traumaties.	Gewoonlik ateroskleroties. Soms lueties.
Patologie	Meestal sakvormig. Af en toe spoelvormig.	Gewoonlik spoelvormig. Meestal onderkant artt. renales geleë.
Klinies	Gewoonlik onder 55 jaar. Dikwels pyn of simptome van druk op trachea, esofagus of been (erosie).	Gewoonlik oor 60 jaar. Pyn minder gewoon.
Prognose	Baie swak. Meeste sterf 6 maande tot 2 jaar na begin van simptome.	Beenerosie seldsaam. Nie so erg nie, en meer wisselvallig. Kan soms jare teenwoordig wees, maar kan soms lek of bars.

volg. Dit is gerieflik om aneurismas van die torakale en abdominale dele van die aorta afsonderlik te bespreek. Tabel 1 vergelyk baie kortliks die etiologiese, patologiese en kliniese eienskappe van aneurismas in hierdie twee ligginge.



Op *aneurismas van die torakale aorta* word twee soorte direkte operasies gedoen, naamlik: (i) Eksisie van die aneurismale sak, en laterale herstel van die aorta, soos in geval No. 4 gedoen is. Ten spyte van verspreide luetiese veranderinge in die aorta, blyk dit dat in die meerderheid van hierdie gevalle die aortawand om die basis van die aneurisma sterk en taai genoeg is om, eerstens, die afsnoerende klem, en, tweedens, die hegtings te hou. Die metode is dus prakties uitvoerbaar en kan in geskikte gevalle met welslae toegepas word, soos uit artikels deur o.a. Debaquey en Cooley,<sup>3</sup> en deur Bahnson<sup>2</sup> blyk. Weens die swak vooruitsig vir hierdie pasiënte sonder operatiewe behandeling, behoort operasie aanbeveel te word.

(ii). Eksisie van die aangetaste deel van die aorta tesame met aneurisma, en vervanging daarvan deur 'n transplantaat. Terwyl metode (i) gebruik word vir die meer gewone sakvormige tipe van aneurisma in die torakale aorta, word hierdie metode nodig vir die minder gewone spoelvormige tipe aneurisma of vir die sakvormige tipe wat 'n baie breë basis het. Afklemming van die hele aorta terwyl eksisie en oorplanting gedoen word, skep ernstige probleme wat mettertyd opgelos word. Die belangrikste van hierdie probleme is die arteriële voorsiening van die dele distaal tot die klem, naamlik, die harsings (indien proksimaal tot 'n arteria carotis communis afgeklem), die rugmurg, die niere, lewer en ingewande. Nog 'n probleem ontstaan wanneer afklemming proksimaal tot die linker arteria subclavia gedoen moet word, omdat daar dan meer las op die hart geplaas word, moontlik met gevolglike akute hartversaking. Hierdie probleme word nou die hoof gebied deur die gebruik van tydelike omleidingstransplantate wat voor afklemming van die aorta proksimaal en distaal van die patologiese deel ingeplant word, om die bloedsomloop gedurende afklemming, verwydering van die aneurisma en vervanging in stand te hou (die beginsel van omleiding is in geval No. 4 gebruik). Met gebruik van hierdie metode is aneurismas van die aorta descendens en van deel van die aortaboog met welslae verwyder. Pogings om die hele aortaboog te verwyder en vervang is ook al aangewend,<sup>4</sup> maar sover bekend, tot dusver net met tydelike sukses. Dit lyk egter baie waarskynlik dat die hele aortaboog binnekort met sukses verwyderbaar sal wees. Om die verminderde distale bloedsomloop gedurende afklemming minder gevaarlik te maak, is al van algemene liggaamsverkoeling gebruik gemaak, maar dit skyn asof doeltreffende omleidings hierdie metode sal vervang. Hoewel beskadiging van die rugmurg veel minder waarskynlik is wanneer tydelike omleidings gebruik word, moet ge-waarsku word dat die arteriële toevoer na hierdie deel van die torakale rugmurg so swak en wisselvallig is, dat onderbinding van slegs 'n paar interkostale arteries tot ischemie van die rugmurg kan lei.<sup>5</sup>

Hoewel dissekerende aneurismas nie nou ter sprake is nie, kan net daarop gewys word dat selfs hierdie noodlottige toestand al in enkele gevalle met welslae operatief behandel is.

*Aneurismas van die abdominale aorta* is meer vatbaar vir operatiewe behandeling as die van die torakale aorta. Meer as 90% van hierdie abdominale aorta-aneurismas lê distaal tot die niervate, en die bespreking

sal tot hierdie groep beperk word omdat hulle in teenstelling met die wat op hoogte van of hoër as die niervate geleë is, 'n redelike kans vir operatiewe behandeling bied. Hierdie aneurismas is gewoonlik spoelvormig en is dus nie vatbaar vir eksisie van die aneurismasak en laterale hegting nie. Eksisie van die hele aangetaste deel van die aorta tesame met die aneurisma moet gedoen word. Gelukkig is afklemming van hierdie deel van die aorta vir 'n redelike tyd (tot 2 uur, indien nodig) sonder noemenswaardige gevaar vir die distale dele. Hierdie operasie is reeds in honderde gevalle gedoen al, met 'n sterfesyfer wat wissel van 10 tot 20% in gevalle wat opereer is voordat lekkasie plaasgevind het. Die meerderheid van die sterftes was die gevolg van ge-paardgaande arteriële siekte in lewensbelangrike organe, soos die hart of niere.

Dit is dus duidelik dat daar 'n operasie vir die genesing van abdominale aorta-aneurisma beskikbaar is. Die vraag waarom geen eenstemmigheid bereik is nie, is of alle pasiënte met abdominale aorta-aneurismas opereer behoort te word, en, indien nie, wat die aanduidings vir operasie in enige bepaalde geval is. Hier volg 'n baie beknopte oorsig oor sekere artikels en menings omtrent die saak:

Kampmeier<sup>6</sup> het reeds in 1936 'n mededeling gemaak i.v.m. 73 gevalle van abdominale aorta-aneurisma, waarvan 57.3% lueties en sowat 67.6% onder die ouderdom van 45 jaar was. Van 38 van hierdie pasiënte wat dood is, het 31 gesterf as gevolg daarvan dat die aneurisma gebars het. Hierdie bevindings sou die indruk skep dat so 'n aneurisma uiters gevaarlik is, maar daar moet onthou word dat Kampmeier se reeks 'n hoë persentasie luetiese aneurismas bevat het, en gevolglik nie streng vergelykbaar is met die arteriosklerotiese tipe wat hedendaags oorwegend is nie. In hierdie verband kan na die werk van Maniglia en Gregory<sup>7</sup> verwys word. Na aanleiding van 'n analiese van 6,000 lykskouings het hulle tot die gevolgtrekking gekom dat abdominale aorta-aneurismas toeneem in vergelyking met torakale aorta-aneurismas, dat arteriosklerotiese aneurismas toeneem in vergelyking met luetiese aneurismas, en wat abdominale aorta-aneurismas betref 96% ateroskleroties is. Hulle skryf hierdie veranderinge toe aan die afname in lues as sulks, en die toename in aterosklerose a.g.v. die bereiking van hoër leeftye. Estes,<sup>8</sup> 'n internis van die Mayo Clinic, het in 1950 verslag gedoen oor 102 gevalle van abdominale aorta-aneurisma, waarvan 97 as ateroskleroties beskou is. Van hierdie gevalle het omtrent  $\frac{1}{3}$  binne 'n jaar nadat die diagnose gemaak is, gesterf; omtrent 50% het binne 3 jaar gesterf; en omtrent 80% binne 5 jaar. Van pasiënte wat gesterf het, was lekkasie of bars van die aneurisma die oorsaak van die dood in omtrent 63%. Volgens sy bevindings was die gevaar van dood as gevolg van die aneurisma self dus matig groot. Hy het terloops ook die mening uitgespreek dat die prognose nie beter is in pasiënte sonder simptome as in die met simptome nie. Blakemore<sup>9</sup> meen, na aanleiding van 32 gevalle, dat diepgeleë buikpyn, lae rugpyn (as dit aan die aneurisma toegeskryf kan word) en pyn wat na die heupe of bene uitstraal, tekens van dreigende gevaar is, en gevolglik ten gunste van operatiewe behandeling gereken moet word. Rob<sup>10</sup> verwys na die bevinding van

Colt in die oud langer le maar hier tussen Crane<sup>11</sup> tiese abo dat in l aneurism kleiner a wat min deursnee gevolgtre aneurism maande gemaak 1954 tyd dat abdo opereer dood ve menings word di

Opera aangedui voorkom siekte of 'n deurslae rugpyn aneurism

Opera van hoë van enig twee te persone snee van daarvan driemaal grootte n tog oper Gevall op hulle moontlik

Gebars valle 1 en die aand die toes (Engels: onmidde nie. Me of dae o pasiënt l die pasi te kry v van pasi wat ande gered ka abdomin is wat o dramatise wat volk



teen-ervate deling nig en ak en etaste moet e deel (nodig) dele. en al, evalle Die n ge-rgane, nesing Die nie, is ismas e aan- Hier els en maak isma, er die siënte at die u die lik is, reeks et, en klero- hierdie gory? 6,000 m dat yking otiese neuris- betref eringe me in eeftey. 1950 aorta-u is. at die binne Van an die 63% od as ty het gnose e met an 32 it aan na die ar is, deling ng van

Colt in 1927 dat pasiënte met aneurismas wat eers na die ouderdom van 60 jaar ontdek word, gewoonlik langer lewe as die wat in die dertiger- of veertigerjare is, maar hierdie bevinding kan moontlik net die onderskeid tussen luetiese en arteriosklerotiese aneurismas aandui. Crane<sup>11</sup> het lykskouings op 44 gevalle van arteriosklerotiese abdominale aorta-aneurisma nagegaan, en gevind dat in 15 gevalle die dood veroorsaak is deurdat die aneurisma gebars het. Van hierdie 15 gevalle was net 1 kleiner as 6 sm. deursnee (uit 'n totaal van 26 gevalle wat minder as 6 sm. was) en 14 was groter as 7 cm. deursnee (uit 17 wat oor 7 sm. in deursnee was). Sy gevolgtrekking was dat solank die deursnee van 'n aneurisma minder as 6 sm. is, die gevaar dat dit binne maande sal bars, baie gering is. Dan moet nog melding gemaak word van die mening van Michael Boyd wat in 1954 tydens 'n besoek aan Suid-Afrika uitgespreek is, dat abdominale aorta-aneurismas wat nie lek nie, nie opereer behoort te word nie, omdat hulle so selde die dood veroorsaak. Uit die voorafgaande artikels en menings tesame met 'n geringe plaaslike ondervinding, word die volgende gevolgtrekkings gemaak:

Operatiewe behandeling van die aneurisma word aangedui in 'n pasiënt wat andersins redelik gesond voorkom, en geen tekens van ernstige koronêre vaat-siekte of niersiekte toon nie; wat 'n aneurisma het met 'n deursnee van meer as 7 sm.; of wat diepgeleë buikpyn, lae rugpyn of pyn in die heupe en bene het, wat aan die aneurisma toegeskryf kan word (Vgl. geval 3).

Operasie word nie aangedui in persone wat omrede van hoë ouderdom, ander ernstige vaatsiekte of siekte van enige aard nie verag word om meer as 'n jaar of twee te lewe nie. Dit word ook nie aangedui in ouer persone bv. oor 70 jaar, wat 'n aneurisma met 'n deursnee van minder as 6 sm. het, en wat geen simptome daarvan ondervind nie. Laasgenoemde groep moet driemaandeliks gesien word. Duidelike toename in grootte met ontwikkeling van simptome sou waarskynlik tog operasie hier aandui.

Gevalle wat nie in een van hierdie groepe val nie, moet op hulle meriete behandel word. Latere ervaring mag moontlik wysiging van hierdie voorstelle nodig maak.

Gebarste abdominale aorta-aneurismas (waarvan gevalle 1 en 2 voorbeelde is) behoort meer pertinent onder die aandag van geneeskundiges gebring te word. Hoewel die toestand as 'n 'gebarste aneurisma' beskryf word (Engels: ruptured aneurysm) is dit baie dikwels nie onmiddellik noodlottig soos miskien verwag kon word nie. Meestal is dit 'n lekkende aneurisma, wat oor ure of dae of selfs weke lek voordat dit tot die dood van die pasiënt lei. Om hierdie rede is daar byna altyd tyd om die pasiënt na 'n geskikte hospitaal te bring en gereed te kry vir operasie. Dit is waarskynlik dat omtrent 60% van pasiënte met gebarste abdominale aorta-aneurismas, wat andersins sekerlik noodlottig sou wees, deur operasie gered kan word. Die stelling dat 'n gebarste of lekkende abdominale aorta-aneurisma 'n chirurgiese noodtoestand is wat onmiddellike operasie vereis, is nie bloot 'n dramatiese gebaar van die chirurg nie, maar 'n feit wat volkome aanvaar en toegepas behoort te word.

## B. ANEURISMAS VAN DIE PERIFERE ARTERIES

### Geval No. 6: Arteriële Aneurisma en Fistel tussen Linker Arteria Subclavia en Vena Subclavia

'n Blanke man, 50 jaar oud, is onder dr. F. Ziady opgeneem met klagtes van toenemende kortasemigheid en moegheid en geringe edeem van die onderbene. Hy is 19 jaar gelede deur 'n natuurel met 'n mes in die linker supraklavikulêre gebied gestek. Daar was dadelik kwaai bloeding, wat na tydelike stelping deur plaaslike druk deur sy vrou, deur sy dokter gestelp is, deur die wond te heg. Weens verdere lekkasie moes meer hegtings die volgende oggend ingesit word. Die wond het goed genees, maar betreklik kort daarna het hy van 'n trilling in die gebied bewus geword, wat tot opname nog altyd waarneembaar was. Daar het ook 'n knop ontstaan wat min of meer dieselfde grootte gebly het. Sy linkerarm het gedurende die eerste paar dae na die besering swak en dood gevoel maar het met verloop van maande geleidelik verbeter en weer sterk genoeg geword om hom in staat te stel om sy werk te doen.

Met ondersoek van die nek is daar bokant die middelste deel van die clavicula 'n kloppende geswel, omtrent 2 by 3 sm. groot, sigbaar. Die oorspronklike wondjie is goed genees maar nog oor die laterale deel van die geswel sigbaar. Die vene van die linkerkant van die nek is uitgeset vergeleke met die regterkant. Met betasting is die opvallende bevinding 'n growwe trilling oor die knop en 'n groot deel van die supraklavikulêre gebied. Die geswel lê bokant die middelste derde van die clavicula, maar sy onderste rand verdwyn agter die clavicula. Die hele geswel toon uitsettende klopping, behalwe vir die boonste deel wat baie hard is en net saam met die res beweeg word. Met beluistering word 'n growwe geruis gehoor wat, hoewel harder gedurende die sistoliese fase, tog baie duidelik hoorbaar is gedurende diastole. Die geruis is op sy hardste oor die geswel, maar word ook mediaalwaarts oor die mediale deel van die clavicula, lateraalwaarts oor die boonste deel van die arm en na onder toe net onderkant die clavicula gehoor. Oor die carotidate was dit moeilik hoorbaar.

Die linker-boarm was dikker as die regter. Daar was geen opvallende tekens van inkorting van die arteriële bloedsomloop van die linkerarm nie. Die polse was in die twee arms goed voelbaar, maar die bloeddruk was links 140/80 mm. Hg., vergeleke met 210/100 mm. Hg. regs. Die bewegings van die linkerarm was normaal en daar was geen opvallende sensoriese gebrek nie.

Ondersoek van die hart het net matige algemene vergroting daarvan getoon. Die tweede klank by die aortagebied was harder as normaal. Radiologiese ondersoek van die hart het matige vergroting waarskynlik hoofsaaklik van die linker ventrikel getoon.

Radiologiese ondersoek van supraklavikulêre gebied het 'n verkalking van omtrent 1½ cm. deursnee getoon. Arteriogram is nie gedoen nie, omdat daar verwag is dat met so 'n groot knop, dit onwaarskynlik sou wees dat die fistel self duidelik omlin sou kon word. Daarby sou 'n arteriogram van hierdie gebied tegnies moeilik en moontlik gevaarlik wees. Die linker diafragma het goed beweeg.

Die diagnose van 'n traumatiese arteriovenuse fistel met aneurismale uitsetting van die arteria subclavia self of van die fistel, is gemaak. Dit is baie waarskynlik geag dat die arteriovenuse fistel tot die hartvergroting en ligte versakingsbeeld bygedra het. Die ander faktor wat hier toe bygedra het, was die essensiële hipertensie waaraan hy gely het. Operasie is aanbeveel, hoofsaaklik met die bedoeling om die fistel te sluit en sodoende die las op die hart te vermind.

Operasie is op 27 Junie 1956, onder algemene narkose deur dr. Pen Wessels, gedoen. 'n Snit is aan die linkerkant van die nek net bokant die hele lengte van die clavicula gemaak, en die middelste 2/3des van die been verwyder. Weens die digte verklewings van die strukture in die omgewing was die disseksie besonder moeilik, maar uiteindelik kon die volgende uitgeken word: die kloppende geswel self, wat 'n aneurismale uitsetting van die arteria subclavia was; die aansluiting van vena subclavia en vena jugularis interna en die erg uitgesette ductus thoracicus (geskat op omtrent 8 mm. dikte); die plexus brachialis, waarvan die mediale deel aan die laterale deel van die aneurisma erg verkleef was; en die fistel wat tussen die onderkant van die arteriële aneurisma en die vena subclavia gestrek het, en omtrent 7 mm. lank, 8 mm. diep, en 11 mm. breed was. Die fistel is gesluit deur die vena subclavia proksimaal en distaal daarvan af te bind, en die oorsprong van die fistelgang

vanaf die arteriële aneurisma toe te werk. Die arteriële aneurisma het mediaalwaarts en afwaarts gestrek tot agter die mediale deel van die clavicula en die sternum, en sy onderste einde kon nie vanuit die nek bereik word nie. Omrede die ligte hartversaking, die noodsaaklikheid van 'n meer uitgebreide toegang bv. transsternaal—indien die aneurisma verwyder sou moes word, die erge verklewing aan die plexus brachialis en die feit dat die aneurisma self nie oor jare toegeneem het nie, is besluit om geen poging aan te wend om dit te verwyder nie. Die wond is op die gewone manier gesluit sonder enige poging om die clavicula te herstel.

Na operasie was daar vir omtrent 5 dae eedem van die linkerarm wat daarna geleidelik, maar volledig verdwyn het. Hy is 6 weke later weer gesien. Die wond was mooi genees. Daar was geen teken van trilling of geruis nie, maar die kloppende geswel was nog voelbaar. Daar was geen eedem of neurologiese afwyking van die linkerarm nie. Bewegings van die skouer was normaal. Hy het gesê dat hy minder kortasemig en minder moeg as voorheen voel. Sy arteriële bloeddruk was hoër as voorheen, naamlik 230/130 mm. Hg. i.p.v. 210/100 mm. Hg. Hy is weer 4½ maande na operasie gesien. Sy simptome het heeltemal verdwyn en hy het selfs op eie houtjie al 'n bietjie krieket gespeel. Hy het sonder digitalis en kwik, wat voorheen nodig was, goed klaargekom. Die bloeddruk was nog 230/130.

#### Opmerkings

Die toegang tot die arteriovenuse fistel deur verwydering van die middelste 2/3des van die clavicula was in hierdie geval voldoende. Dit was egter ontoereikend vir goeie blootlegging van die arteriële aneurisma, waarvoor sternumspilting waarskynlik nodig sou gewees het. Die vraag of dit nou wel die arteriovenuse fistel was wat die ligte hartversaking en hartvergroting veroorsaak het, is nog nie met sekerheid opgelos nie, omdat die moontlikheid bestaan dat die hipertensie alleen hiervoor verantwoordelik kon gewees het. Die opvallende kliniese verbetering 4½ maande na operasie, is egter sterk ten gunste daarvan dat die arteriovenuse fistel 'n belangrike rol in sy hartversakingsbeeld gespeel het. Die styging in die diastoliese bloeddruk na operasie is interessant, en miskien nie onverwags nie.

#### Geval No. 7: Aneurisma van die Arteria Femoralis.

'n Blanke vrou, 65 jaar oud, is onder dr. C. A. R. Schulenburg opgeneem omrede van kwaai pyn en 'n kloppende geswel in die linker liesgebied. Sy was al 'n paar jaar bewus van 'n ongemak in die linkerlies, en het verskeie maande gelede 'n kloppende geswel daar opgelet, wat sedertdien groter begin word het. Omtrent dieselfde tyd het dit pynlik begin word. Die pyn wat in die linkerlies die ergste was, maar ook in die linkerheup en langs die dy af gevoel is, het geleidelik toegeneem, sodat sy vir die afgelope maand moeilik kon stap en vir die afgelope 2 weke genoodsaak is om in die bed te bly. 'n Paar maande gelede het die linker onderbeen geswel, maar die geswel het geleidelik afgeneem, sodat daar op die oomblik geen onderbeengeswel is nie. Sy het nooit van kloudikasiepyn gekla nie. Sy onthou geen besering of operasie in die gebied nie. Daar is geen klagte i.v.m. die hart, longe of ander selsels nie.

Met ondersoek is dit dadelik opvallend dat sy baie pyn verduur. As sy plat op haar rug lê word die linkerheup in 'n fleksiestand van ongeveer 30 grade gehou. Pogings om die been plat op die bed te druk veroorsaak aansienlike pyn. Daar is 'n groot, vaagomlynde geswel in die gebied net onderkant die linker liesligament sigbaar. Dit strek mediaalwaarts tot omtrent 1 sm. vanaf die tuberculum pubis, lateraalwaarts tot omtrent 2 sm. vanaf die spina iliaca anterior superior en afwaarts tot omtrent 8 sm. onderkant die liesligament. Met betasting word gevind dat die grense van die geswel taamlik swak afgebaken is, maar dat 'n verlenging daarvan opwaarts agter die liesligament voelbaar is. Die geswel was erg drukgevoelig. 'n Harde sistoliese geruis was oor die hele kloppende geswel, maar nie verder af- of opwaarts nie, hoorbaar. Oor die ligging van aansluiting van arteria femoralis en aneurisma kon ook 'n sagte diastoliese geruis gehoor word. Die onderbeen polse was normaal en geen ander afwyking kon hier gevind word nie. Die bloeddruk was 160/110 mm. Hg. Kliniese en elektrokardiografiese ondersoek van die hart het geen afwyking getoon nie. Die res van die bloedsaatselsel het geen growwe afwyking getoon nie.

Die kliniese diagnose was die van aneurisma van die linker arteria femoralis. Omrede vinnige toename in pyn in die voorafgaande 2 weke, tesame met die drukgevoeligheid, is dit vermoed dat die aneurisma aan die lek was.

Operasie is op 8 September 1956 gedoen, onder algemene narkose deur dr. Barnard. Die arteria iliaca externa is deur 'n snit parallel met en 2 tot 3 sm. bokant die liesligament blootgelê. Die arteria iliaca externa is losgemaak en met 'n kateter omsingel vir gebruik indien skielik nodig. 'n Snit is in die boonste derde van die dy oor die lyn van die arteria femoralis gemaak, en die arteria onderkant die aneurisma gevind en opwaarts gevolg tot by die aneurisma. Daar is gevind dat die arteria femoralis net vir ongeveer 2½ sm. onderkant die liesligament aangetas is, en dat die aneurisma vanaf 'n laterale opening in die arteria femoralis ontspring het en opwaarts en afwaarts vergroot het. Die arteria iliaca externa is bokant die aneurisma, en die arteria femoralis onderkant die aneurisma met Dieffenbach klemme afgeklem, en 15 ml. verdunde Heparinoplossing (5,000 internasionale eenhede per 200 ml. normale soutoplossing) distaal ingespuut. Klopping het opgehou, maar die aneurisma was nog taamlik styf gespan. Die aneurismasak is ooggemaak en die stolsel daaruit verwyder. Bloeding het nog plaasgevind deur twee kollaterale vate in die boonste deel van die arteria femoralis waaruit die aneurisma ontspring het. 'n Klem is hierop geplaas. Die opening van die femoralis in die aneurismasak was op die laterale oppervlakte daarvan en was omtrent 2 sm. lank. Die wand van die arteria was hier erg verkalk. Die sak het in die diepte tussen iliopsoas en pectineus ingedring, na boontoe tot omtrent 2 sm. bokant die liesligament, afwaarts omtrent 8 sm. en lateraalwaarts omtrent 10 sm. gestrek. Dit is stuksgewys verwyder. Die mediale deel was matig verkleef aan die vena femoralis, maar kon verwyder word. 'n Klein stukkie sak bokant die liesligament is nie verwyder nie. Daar het 'n taamlike diep holte oorgebly wat gedeeltelik opgevol is deur die iliopsoas en pectineus met 'n paar kroomdrade na mekaar te trek. Die aangegetaste deel van die arteria femoralis is verwyder. Die iliaca externa was 'n bietjie atermatous maar nie baie erg nie. Die gaping van ongeveer 5 sm. is met 'n bevrore gedroogde carotis communis transplantaat oorbrug. Met loslating van die klemme, wat ongeveer 130 minute op was, het distale klopping plaasgevind. Geen val in die bloeddruk is opgelet nie. Die wond is op die gewone manier gesluit met spesiale aandag aan die diep fascia, en 'n klein dreineringsbuis is net tot in die holte geplaas. Sy het die operasie goed verdra en dadelik na operasie was die voetpolse goed voelbaar.

Na operasie is die voetenend van die bed opgelig gehou en antibiotika is toegedien. Geen Heparin is gebruik nie. Behalwe vir geringe eedem van die onderbeen wat sowat twee weke na operasie verskyn het, het sy goed herstel. Sy is na ontslag nog nie weer gesien nie.

#### Opmerkings

Die verwyderde stukkie arteria femoralis was erg verkalk, en die iliaca externa het enkele aterosklerotiese kolle getoon. Die Kolmer reaksie was negatief. Die aneurisma word dus as 'n aterosklerotiese aneurisma beskou. Die diagnose van moontlike lekkasie was verkeerd, maar dit is redelik seker dat die toenemende pyn die gevolg was van vinnige uitsetting van die aneurisma.

#### Geval No. 8: Aneurisma van die Arteria Poplitea

'n Blanke vrou, 69 jaar oud, is onder prof. C. H. Derksen opgeneem met die klagte van 'n pynlike kloppende geswel in die regter fossa poplitea. Sy was 6 maande vroeër 'n pasiënt in die Interne Afdeling met klagte van kloudikasie in die linkerbeen. Arteriografie, wat destyds gedoen is, het 'n afsluiting van die linker arteria femoralis met redelike goeie kollaterale sirkulasie getoon. Daar is teen enige operatiewe ingryp besluit en medikamenteuse behandeling is gegee. 'n Paar weke voor opname het sy eedem van die regter onderbeen gehad wat deur haar huisdokter as diep veneuse trombose beskou is. Dit het tot 'n mate verbeter, maar 10 dae voor opname het sy pyn in die onderste mediale deel van die regterdy en fossa poplitea ondervind en 'n geswel hier opgelet. Sy het dit moeilik gevind om te stap en het ook kramppe in die kuit gekry. Sy ly al jare aan hoë bloeddruk en is geneig om maklik moeg te word en hoofpyn te kry.

Onderzoek Sy is 'n gesette vrou wat nie tekens van ernstige hartversaking toon nie. Die bloeddruk was 230/120 mm. Hg. Daar was matige hartvergroting, maar geen ander afwyking nie. Aan die mediale kant van die heel onderste deel van die regterdy en in die mediale deel van die fossa poplitea was 'n kloppende geswel sigbaar en voelbaar. Die grootte was ongeveer 7 by 4 sm. In hierdie been kon die arteria femoralis se pulsasie baie goed gevoel word, maar die tibialis posterior pulsasie was afwesig en die dorsalis pedis het baie swak geklop. Tog was daar nie tekens

van ernstige  
In die linker  
die voetp  
aneurisma

Die kli  
poplitea  
te doen o  
bokant di  
was. Die  
oop, trou  
ting gedu  
uitvloei a  
in grootte  
dreigende  
sou gewe  
operasie i  
skynlik n

Operasi  
deur dr. D  
linkerbeen  
Die regter  
tafel gele  
dy is bloo  
of meer  
gemaak.  
bokant di  
suiver po  
geleë was  
is die art  
loslating  
Die aneu  
vinger bin  
vergemak  
in die geb  
was disse  
van die ar  
bevrore g  
Na loslati  
gevind, er  
male ana  
bloeddruk  
opgehou.  
van die b  
van volde  
die operas  
ers na 2  
gestyg. I  
aandag a

Na op  
24 uur ko  
gekry. E  
voet duid  
met gerin  
'n opperv  
eindelik t  
5 maande  
die been.  
regter- of  
Haar blo

Opmerkin  
Die toe  
maar die  
wees as v  
Die gev  
kon nie a  
vergelikk  
operasies  
Die ver  
in die vo  
vaatspasn

BESPREEK

Hoew  
sienlike

van ernstige arteriële inkorting nie. Daar was ook geen edeem nie. In die linkerbeen kon net die arteria femoralis gevoel word en nie die voetpols nie. Die abdominale aorta was goed voelbaar en nie aneurismaal nie. Daar was geen glukose in die urien nie.

Die kliniese diagnose was aneurisma van die regter femoro-popliteale aansluiting. Daar is besluit om 'n femorale arteriogram te doen om vas te stel wat die toestand van die arteria femoralis bokant die aneurisma was, en hoe goed die uitvloei distaal daartoe was. Die arteriogram het getoon dat die arteria femoralis goed oop, trouens wyer as normaal, was, maar ongelukkig het die beligting gedurende die arteriogram te vroeg plaasgevind om die distale uitvloei aan te dui. Operasie is aanbeveel omdat die aneurisma in grootte toegeneem het en pynlik was, wat die moontlikheid van dreigende lekkasie gestel het. Indien die aneurisma toevallig ontdek sou gewees het, en geen simptome sou veroorsaak het nie, sou operasie in haar geval omrede van haar baie hoë bloeddruk waarskynlik nie aanbeveel gewees het nie.

Operasie is op 24 Mei 1956, gedoen onder algemene narkose deur dr. Dippenaar. Die pasiënt het op haar regtersy geë met haar linkerbeen hoog opgetrek, sodat sy byna op haar maag gelê het. Die regterbeen het op sy anterolaterale oppervlakte op die operasietafel gelê en die posteromediale deel van die onderste 2/3des van die dy is blootgelê tesame met die fossa poplitea. 'n Skuinsnit min of meer in die rigting van die arteria femoralis en poplitea is gemaak. Die arteria poplitea is onderkant en die arteria femoralis bokant die aneurisma blootgelê. Dit is gevind dat die aneurisma suiver popliteal was omdat dit onderkant die adduktor hiatus gelê was. Voordat verdere manipulasie en disseksie gedoen is, is die arteria bokant en onderkant die aneurisma afgeklem om loslating van stolsels, wat embolie kon veroorsaak, te voorkom. Die aneurismasak is oopgemaak en stolsels verwyder om met die vinger binne in die sak disseksie van die omliggende weefsels te vergemaklik. Dit was erg verkleef aan die vena femoralis, en veral in die gebied agter die semimembranosus en semitendinosus spiere was disseksie moeilik. Na verwydering van die aangetaste deel van die arteria en aneurismale sak is die gaping oorborg met 'n bevrore gedroogde arteria carotis communis homotransplantaat. Na loslating van die beheerende klemme het distale pulsasie plaasgevind, en heelwat meer as die gewone bloeding het by die proksimale anastomose ontstaan, waarskynlik a.g.v. die verhoogde bloeddruk. Dit het bloot met plaaslike druk en 'n enkele steek opgehou. Na loslating van die klemme het 'n geweldige daling van die bloeddruk na 70 mm. Hg. sistolies plaasgevind, ten spyte van voldoende vervanging van verlore bloed. Aan die einde van die operasie was die bloeddruk maar 120/70 mm. Hg., en dit het eers na 2 of 3 dae weer geleidelik na die vooroperatiewe hoogte gestyg. Die wond is op die gewone manier gesluit met spesiale aandaan aan die diep fascia.

Na operasie was sy vir 2 dae baie lomerig. Die voet het vir 24 uur koud en bleek gebly, maar na 48 uur het dit 'n goeie kleur gekry. Eers na 'n paar dae kon die pols op die dorsum van die voet duidelik gevoel word. Sy is na ongeveer 2½ weke ontslaan, met geringe geswel van die onderbeen en 'n blaas op die hak, wat 'n oppervlakkige ulkus gelaat het wat taamlik traag, maar uiteindelik tog wel genees het. Berigte van haarself en haar dokter 5 maande na operasie dui op 'n redelik bevredigende toestand van die been. Sy kan nog nie lang afstande stap nie, maar of dit die regter- of die linkerbeen is wat haar inkort, is nie vermeld nie. Haar bloeddruk is nog baie hoog.

#### Opmerkings

Die toegang bied redelike goeie blootlegging van hierdie gebied, maar die semimembranosus en semitendinosus spiere kan lastig wees as verklewings direk agter hulle gelê is.

Die geweldige daling in bloeddruk na loslating van die klemme kon nie aan bloedverlies toegeskryf word nie, en kon moontlik vergelykbaar wees met tourniquetskok wat al in 'bloedlose veld' operasies beskryf is.

Die vertraagde verskyning van tekens van goeie bloedsomloop in die voet eers omtrent 48 uur na operasie moet waarskynlik aan vaatspasme toegeskryf word.

#### BESPREKING VAN BEHANDELING VAN ANEURISMAS VAN DIE PERIFERE SLAGARE

Hoewel chirurgie veral a.g.v. oorlogsbeserings aansienlike ervaring met die behandeling van perifere

arteriële aneurismas opgedoen het, was die resultate, hoewel in sekere opsigte bevredigend, nie ideaal nie. Tot omtrent 10 jaar gelede was die hoofdoel van die operasie die verwydering of afsluiting van die aneurisma, bv. deur eksisie of deur Matas se obliteratede endo-aneurismorrhafie. Die arteriële toevoer na die distale dele moes deur die kollaterale vate behartig word. Hoewel gangreen gewoonlik nie ontstaan het nie, was die arteriële toevoer dikwels onvoldoende vir oefening, en die pasiënt het gevolglik aan kloudikasie gely. Ten spyte van die werk van Alexis Carrel wat reeds vroeg in hierdie eeu gedoen is, en waarvoor hy die Nobel prys toegeken is, het sy bewyse dat arteries geheg en oorgeplant kan word onbenut gebly tot ongeveer die afgelope 10 jaar. Die hedendaagse neiging in die behandeling van perifere arteriële aneurismas is om die aneurismale deel van die slagaar te verwyder en te vervang met 'n transplantaat van een of ander aard. Oor die algemeen is hierdie beleid geslaagd gewees, beide uit die oogpunt van bewaring van die ledemaat en uit die oogpunt van behoud van normale funksie, ook met oefening. Die belangrikste punt waarop nog twyfel gewerp kan word, is die vraag of die homotransplantaat permanent goed sal werk, sonder om af te sluit of aneurismaal te word. Die finale antwoord hierop kan nog nie gegee word nie. Enkele gevalle van aneurismavorming in die transplantaat is al beskryf. Meer gevalle van trombose in die transplantaat is al aangemeld, maar hulle is nog maar 'n klein minderheid. Verkalking in transplantaat is al beskryf, ook in eksperimentele werk, maar het nog nie in die praktyk groot moeilikheid opgelewer nie. Daarteenoor is daar al sommige transplantaat vir meer as 5 jaar in werking sonder om funksionele moeilikheid op te lewer, en daar is al honderde wat vir korter tydperke bevredigend werk. Daar skyn dus op die oomblik alle regverdiging vir die gebruik van die metode van eksisie van die aneurisma en vervanging deur 'n transplantaat in geskikte gevalle te wees.

Die soort transplantaat wat gebruik behoort te word, sal nie hier volledig bespreek word nie. In die 6 gevalle waarin transplantaat gebruik is, was 5 arteriële homotransplantaat, en een 'n Ivalon protese met Orlon versterk. Van die 5 arteriële homotransplantaat was 3 bevrore gedroogde transplantaat, en 2 was transplantaat wat vir 8 of 9 dae in die gewysigde weefselkwekingsmedium soos deur Gross en andere beskryf, bewaar is. Die verkryging en bewaring van arteriële homotransplantaat en die meriete van die verskillende ander tipes transplantaat word elders bespreek. Hier kan met die opmerking volstaan word dat dit op die oomblik nog vir die vaatchirurg nodig is om verskillende soorte transplantaat en materiaal om transplantaat mee te maak tot sy beskikking te hê. Daarom word in die slagaarbank van die Pretoriase Hospitaal nie alleen homotransplantaat van verskillende anatomiese soorte aangehou nie, maar ook poliviniel alkohol spons (bv. Ivalon of Prosthex), Orlon, Sturdynyl en 'konsertina' nylon (crimped nylon) buise.

Ek wil graag my dank teenoor die volgende persone uitspreek: prof. C. H. Derksen, dr. C. A. R. Schulenburg, dr. F. Ziady, prof. H. W. Snyman en dr. W. H. Davis vir verwysing van die pasiënte; dr. P. Swanepoel, Geneeskundige Superintendent van die Pretoriase Hospitaal, vir toestemming om verslae van die



gevalle te publiseer; vir die narkotiseurs wat met groot geduld en bekwaamheid vir hierdie lang operasies narkose toegedien het; en vir die operasieassistentes en geneesheerassistentes by die operasies vir geduldige hulp en volharding.

#### OPSOMMING

Vyf gevalle van aorta-aneurisma en 3 gevalle van perifere arteriële aneurisma (insluitende 'n arterio-veneuse fistel) op wie operasie uitgevoer is, word beskryf. Na aanleiding hiervan, word die aandag gevestig op die moderne neiging om sulke aneurismas deur meer direkte operatiewe ingrepe, insluitende eksisie en transplantasie, te behandel.

#### SUMMARY

Five cases of aortic aneurysm and 3 cases of peripheral arterial aneurysm (including an arteriovenous fistula)

treated by operation, are described. Attention is drawn to the modern tendency to treat such aneurysms by more direct operative procedures, including excision and arterial grafting.

#### VERWYSINGS

1. Kirby, C. K. en Johnson, J. (1953): *Surgery*, **33**, 562.
2. Bahnson, H. T. (1955): *Henry Ford Hospital International Symposium on Cardiovascular Surgery*, p. 434. Philadelphia: W. B. Saunders Co.
3. Cooley, D. A. en De Bakey, M. A. (1953): *Surgery*, **34**, 1005.
4. Cooley, D. A., McHaffey, D. E. en De Bakey, M. A. (1955): *Surg. Gynec. Obstet.*, **101**, 667.
5. Eismann, B. en Summers, W. B. (1955): *Surgery*, **38**, 1063.
6. Kampmeier, R. H. (1936): *Amer. J. Med. Sci.*, **192**, 97.
7. Maniglia, R. en Gregory, J. E. (1952): *Arch. Path.*, **54**, 298.
8. Estes, J. E. (1950): *Circulation*, **2**, 258.
9. Blakemore, A. H. (1947): *Ann. Surg.*, **126**, 195.
10. Rob, C. G. (1954): *Ann. Roy. Coll. Surg. Engl.*, **14**, 35.
11. Crane, C. (1955): *New Engl. J. Med.*, **253**, 954.

## PROBLEMS ARISING DURING INTERMITTENT-POSITIVE-PRESSURE RESPIRATION FOR THE MEDICAL EMERGENCY OF RESPIRATORY FAILURE

BERIC JACKSON, M.B., M.R.C.S., D.A.

*Department of Anaesthetics, Grey's Hospital, Pietermaritzburg*

Since the poliomyelitis epidemic in Denmark in 1952, intermittent positive-pressure respiration (IPPR) has been used to treat a variety of conditions associated with an inadequate ventilation of the lungs, and in which death had often previously been due to hypoxia or hypercapnoea.

Poliomyelitis, tetanus, polyneuritis, poisoning and injury to the chest or head, are conditions which may be associated with respiratory inadequacy.

Where there is a chance of recovery this form of treatment is valuable, but where there is little hope of functional recovery, IPPR can convert a rapidly fatal condition into a long and distressing terminal illness.

IPPR is carried out by delivering the respiratory gases to the lungs via a tube placed in the trachea. This method of treatment has to a large extent supplanted the use of the tank respirator in cases of respiratory failure associated with inability to swallow secretions from the pharynx.<sup>1</sup>

#### Physiological Considerations

The function of respiration is to supply oxygen and to eliminate carbon dioxide from the body. The adequacy of one function is no guarantee of the adequacy of the other. For example, it has been shown<sup>2,3</sup> that if patients are hypoventilated with a 20% oxygen mixture, such as to double the alveolar carbon-dioxide tension (from 40 to 80 mm. Hg) in the lungs, the alveolar oxygen tension is reduced to 54 mm. Hg. The oxyhaemoglobin-dissociation curve shows that this represents about 80% saturation in arterial blood, which is the approximate cyanosis-level in a person with a normal haemoglobin value. It may therefore be concluded that the carbon-dioxide tension in alveolar air can be doubled before cyanosis appears, even when air is used for respiration.

Scurr<sup>4</sup> and others have stressed the need to calculate the ventilation required for each individual by the use of physiological data. It has also been proved that if these calculated ventilation volumes are put into effect, the subjects are adequately oxygenated, and the carbon dioxide eliminated.<sup>5,6</sup>

The alveolar ventilation rate is the rate of ventilation required to maintain the alveolar carbon-dioxide concentration within normal limits (5½% approximately) in the face of the quantity of carbon dioxide produced in the course of metabolism. In a person producing 200 c.c. of carbon dioxide per minute, the alveolar ventilation rate is  $\frac{200 \times 100}{5\frac{1}{2}}$  c.c. per minute ( $\pm 4$  litres).

From an individual's weight the carbon-dioxide production and dead-space volume can be calculated,<sup>7</sup> and the required tidal volume can be found from the following equation, all the other components being known:

$$\text{Alv. vent./min.} = (\text{tidal vol.} - \text{dead space}) \times \text{resp. rate}$$

A nomogram from this equation has been constructed to show the tidal and minute volume necessary to ventilate a person of any given weight.<sup>7</sup>

#### The Respiratory Cycle

When applying IPPR it is necessary for the inspiratory phase of the respiratory cycle to occupy as short a period as possible. During this time there is an increased pressure in the lungs which, if excessive or prolonged, will materially reduce the venous flow to the right side of the heart, with a consequent lowering of the cardiac output.

Spalding and Young<sup>8</sup> have shown that the most effective way to deliver the tidal volume required in the



shortest time is to produce a very rapid rise of pressure to a peak which is held until the required volume is delivered, whereupon the expiratory phase is begun by the rapid fall of the positive pressure to atmospheric pressure. By using this inspiratory pressure wave-form, the tidal volume necessary can be delivered in every case at a moderate positive pressure within the first third of the respiratory cycle.

The expiratory phase is marked by the passive recoil of the thorax and occupies the remaining two-thirds of the respiratory cycle. If a period of sub-atmospheric pressure is applied during the expiratory phase, it is possible to ventilate the lungs at a lower mean intrathoracic pressure with the same volume of gases. This has the advantage of offering less obstruction to the venous return.<sup>9</sup>

The effect of positive and negative pressure on the structure of the lung in dogs has been studied.<sup>10</sup> Intermittent positive pressures up to 40 cm. water were well tolerated over 4-hour periods. When alternating positive and negative pressures were used, no structural damage occurred unless negative pressures exceeded 5 cm. water. At lower sub-atmospheric pressures, damage occurred to the lung parenchyma, presumably due to transmission of the pressure.

Dobkin *et al.*<sup>8</sup> in a large series of surgical cases, most of which extended over several hours of anaesthesia, tried the effect of 4 different pressure-patterns for respiration on their respirator. In the 1st, +15 mm. Hg and atmospheric pressure was used, timed 1:2 at a rate of 18 per minute; in the 2nd., +15 mm. Hg, -5 mm. Hg and atmospheric pressure was used, timed 1:1:1 at a rate of 18 per minute; in the 3rd, +15 mm. Hg, atmospheric pressure and -5 mm. Hg was used, timed 1:1:1 at a rate of 18 per minute; in the 4th, +15 mm. Hg and -5 mm. Hg with phases timed of equal duration at a rate of 18 per minute. In all these cases, the pressures were adequate to provide the tidal volume as determined by the Radford nomogram.

It was concluded from the above series that in patients with normal lungs, but under the influence of relaxants, a normal respiratory exchange with satisfactory oxygenation and elimination of carbon dioxide could be maintained, regardless of the respiratory pattern used for mechanical respiration. The addition of a negative phase in the respiratory cycle was of no demonstrable value.

In patients with abnormal lungs, with advanced pulmonary tuberculosis, emphysema or fibrosis, where high pulmonary pressures would have been needed for adequate ventilation, or where passive deflation was faulty, the addition of a negative phase was of great assistance in maintaining adequate ventilation. The most satisfactory patterns were the 3rd (+15/0/-5) and the 4th (+15/-5). The second pattern (+15/-5/0) was the least satisfactory in maintaining respiratory requirements.

It may be noted that in cases treated by IPPR over long periods passive deflation becomes progressively more incomplete. The lung volume becomes permanently increased, as in emphysema, and the respiratory mixing efficiency is reduced.<sup>11</sup> To avoid this, the application of an active expiratory phase is logical. This

can be provided by a negative-pressure phase or by a positive compression of the chest by an inflatable belt on expiration, as in the Engström 'universal respirator'.

#### Respiratory Pumps

The simplest way to apply IPPR is to ventilate the patient by means of manual compression of a reservoir bag. The carbon dioxide is eliminated by using a high flow of gases, or a non-return valve, or a soda-lime absorber. This method is effective, but difficult to carry out uniformly over long periods.

To base manual compression on sound physiological principles a hand pump as described by Eastwood and Harbord may be used.<sup>12</sup> An adjusted volume of gas is drawn from a source of supply and delivered to the patient. The volume of expired gases is measured by a spirometer placed in the circuit, and then discharged to the atmosphere. There is no re-breathing and no accumulation of carbon dioxide in the circuit. By including a humidifier on the inspiratory side of the circuit, and a pressure gauge near the endotracheal connection, a known volume of humidified gas can be delivered at a predetermined rate and at a known pressure.

A number of automatic IPPR machines are available. Some of the requirements have already been discussed. Not all the machines are satisfactory, or able to deliver

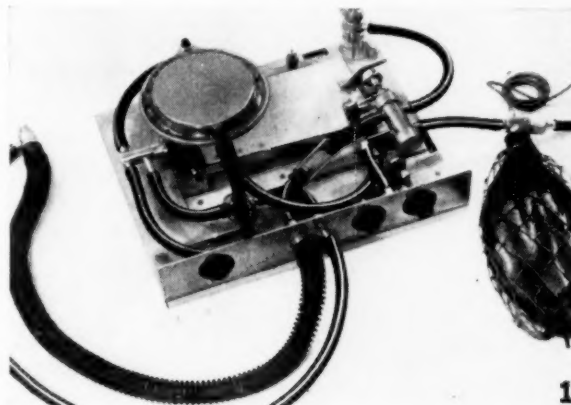


Fig. 1. Newcastle pneumatic respirator.

the required tidal volume in the limited time necessary.<sup>8</sup> The duration and pressure of the inspiratory and expiratory phases should be separately adjustable, and the volume of ventilation measurable. Some machines, such as the Newcastle pneumatic respirator (Fig. 1), incorporate an efficient triggering mechanism to enable the patient to take a breath at any stage of the respiratory cycle when assisted respiration is being carried out.<sup>13</sup>

#### Tracheotomy

Early tracheotomy is advised in all cases where postural drainage and suction cannot maintain an unobstructed air-way, and where it has been decided to use IPPR.<sup>14</sup>

General anaesthesia, with intubation, seems to be

preferable to local analgesia in performing the tracheotomy.

### *Endotracheal Tubes*

The endotracheal tube selected must be the largest one which fits comfortably in the trachea. All connections between the tube and the pressure circuit and the expiratory circuit must be at least as large as the bore of the tube, in order to minimize resistance and allow the sharp rise and fall of the inspiratory pressure-wave. Two types of tubes are used:

1. A modified rubber cuffed endotracheal tube made from a standard Magill tube. The tube is cut straight across just distal to the cuff, and the edges are sandpapered smooth. The upper end is cut off so that the tube is about  $3\frac{1}{2}$  inches long for an adult. (The trachea varies from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  inches long in an adult.) This end is connected to the pressure circuit by a Cobb's suction union. A rubber flange<sup>15</sup> may be used to prevent the tube from slipping down the right bronchus. This complication is not uncommon, and whenever a tube is placed in position, inspection and auscultation of the chest is necessary to assure that bilateral and equal air-entry is present. The cuff is blown up when in position only sufficiently to prevent the leak of gases up the trachea past the tube when the inspiratory pressure is applied. The cuff is deflated 4 hourly to avoid pressure necrosis of the trachea,<sup>16</sup> and the whole tube is replaced every 3 days to avoid herniation of perished cuffs.<sup>17</sup> Before use the cuff should be blown up to ensure an even expansion, and never more than a few c.c. of air should be necessary to seal the cuff. If more is necessary a larger tube is used.

2. A standard silver tracheotomy tube may be used, with a detachable cuff slipped over the outer tube. The inner tube is incorporated in a metal attachment to fit the IPPR circuit. This is a secure attachment, unable to slip down the right bronchus, and unable to kink. Being a rigid appliance, however, anchored to the tracheal mucous membrane by the cuff, trauma is more likely on manipulation. Surgical emphysema and pneumothorax have been reported during IPPR, caused most likely by a traumatic lesion in the trachea through which the respiratory gases are forced under pressure.<sup>18</sup> The sharp right-angle curve present in a silver tube makes the directing of suction catheters down the right and left bronchi more difficult than when catheters are introduced down the suction piece of a Cobb's attachment to a rubber endotracheal tube.

### *Respiratory Gases*

Unless there is a medical reason for using high-percentage oxygen mixtures, air should be used to inflate the lungs. High-oxygen mixtures are followed more frequently by absorption collapse of lung segments distal to any temporary blockage of a bronchus with mucus. The high percentage of nitrogen in air is much more slowly absorbed in similar circumstances.

Clinico-physiological studies during the epidemics of poliomyelitis in Sweden during 1949 and 1950 showed that the commonest cause of a fatal issue was an increasing retention of carbon dioxide while high-oxygen mixtures maintained the arterial blood at normal levels.<sup>19</sup>

### *Humidification*

The necessity for efficient humidification when IPPR is used has been stressed.<sup>20</sup> What is required of a humidifier is to deliver the gases to the tracheostome warmed to 98° F and saturated with water vapour. The temperature at which a thermostatically controlled humidifier is set will vary according to the rate of flow of gases through the humidifier, the outside temperature and the insulation of the delivery tubing. A clinical thermometer placed in the inspiratory gas-flow near the tracheostome should record 98° F, and the temperature of the thermostat should be set to produce it.

The penalty of insufficient humidification is the drying-up of bronchial secretions, causing the bronchi to be plugged with sticky mucus or solid deposits, difficult to remove by suction catheter. Atelectasis frequently occurs.

### *Removal of Secretions*

The frequent use of suction catheters may be necessary to remove secretions. The catheters must be cleaned each time before and after use with 1% Cetavlon which acts as a lubricant and harmless detergent, and they must be frequently sterilized. Care and gentleness are essential in their use.

Resort should be had to tipping, percussion and squeezing of the chest on expiration to bring the secretions within reach of a soft rubber catheter passed down the trachea.

With a curved-beak catheter of the Tiemann type, the right and left bronchi can be entered at will.<sup>21</sup> A catheter with a suitable beak can be made from polythene tubing by dipping a suitable length in boiling water and allowing it to cool in the shape desired. Rough edges at the tip of the catheter are removed by rubbing the end on cloth. Unless particular care is taken with beaked catheters, bleeding and damage to the bronchial mucosa is more likely to occur than when the soft rubber ones are used, and only experienced personnel should use them.

Bronchoscopy is sometimes necessary to remove secretions following extensive atelectasis, but this should be viewed as a failure in preventive measures.

### *Posture*

Cases are best nursed in the horizontal position. Before and during suction they may be tipped, for a time, to a head-down position, prone or supine. While IPPR is being applied a permanent head-down position of more than a few degrees in order to drain bronchial secretions is undesirable. It is accompanied by congestion of the head, neck and lung apices.

Pulmonary oedema and failure of the right or left ventricle are common complications during the treatment of bulbar poliomyelitis. In particular, pulmonary oedema may develop very rapidly. On general medical principles these conditions are not treated by a head-down position, except in cases of hypovolaemic shock, and cardiac arrest. The head-down position may actually precipitate, and it always aggravates, these conditions. During central or peripheral circulatory failure, the volume of blood permanently in the pulmonary circulation will substantially increase in the head-down posture and the vital capacity and lung efficiency will decrease.

When pulmonary oedema develops, the patient may be temporarily tipped head-down. Squeezing of the chest will help the large amount of pink frothy mucus to be aspirated with the catheter. When aspiration is not actually proceeding, the patient is best nursed in a steep head-up position, and the general medical measures, including the application of oxygen, morphia and a diuretic, carried out as circumstances demand.

There is little to be said for the lateral position in so far as the circulatory and respiratory functions are concerned during IPPR, and it has some definite disadvantages. For the drainage of secretions in the right lateral position, it is necessary to tilt the patient to a head-down position of 35° to prevent secretions from the left main bronchus from spilling down into the right main bronchus. In the left lateral position a tilt of no less than 55° head-down is necessary to prevent the drainage of secretions in the opposite direction.<sup>22</sup> It is much safer to use the prone or supine positions for the drainage of secretions, with a head-down tilt. A semi-prone or supine position can be used while a particular side of the chest is being percussed.

The lateral position is the worst position for respiratory function, owing to the uneven gas-distribution and disturbed perfusion-ventilation relations in the lung.<sup>23, 24</sup> The lateral position also accentuates any detrimental effect on the circulation.<sup>25</sup> I am not suggesting that the judicious use of the lateral position is not a good idea in terms of general nursing, but merely pointing out its disadvantages in the presence of excessive secretions, or respiratory or cardiovascular embarrassments.

#### *The Respiratory Muscles*

The value of an active expiratory phase in preventing over-expansion of the chest has been mentioned. Over-expansion of the chest will be accompanied by a continued stretch of the intercostal muscles, which will retard their functional recovery.

In cases of poliomyelitis with affection of the respiratory muscles, it is a thoroughly bad practice to allow the patient to struggle on with his remaining respiratory and accessory muscles of respiration until 'he cannot maintain his colour' or until more urgent circulatory or respiratory symptoms dictate action. When it is clinically evident that there is a weakness of the intercostals or the diaphragm, and a suitable respirator is available, the patient must be placed in it, to support the remaining muscles, and to endeavour to prevent further and permanent damage to these muscles essential to life. It is ironical to see a patient with poliomyelitis resting all his muscles except the ones that matter most.

#### *Complications*

Two complications frequently occurring in the course of bulbar poliomyelitis under treatment with IPPR are pneumonia and hyperpyrexia.

During the active phase of the disease it is most important to provide a prophylactic antibiotic. The presence of a tracheotomy, and frequent use of bronchial catheters, may account for the frequency of pneumonia. Frequent chest X-rays, and bronchial swabs, where necessary, are helpful in identifying and assessing the

sensitivity of organisms. Of the first 5 cases of bulbar poliomyelitis treated in England, 1 died from aspiration pneumonia and 2 died from pulmonary infection.<sup>16</sup>

The mortality in patients who develop temperatures over 105° F for any length of time is very high indeed.<sup>26</sup> The treatment in the present state of our knowledge is clear. If the temperature rises above 103° F, cold sponging and fanning must be carried out until it is lowered; if above 104° F, cooling by the use of phenothiazine drugs in conjunction with ice packs<sup>27</sup> is essential if the simpler measures have failed. Chlorpromazine alone will not produce any appreciable cooling, but must be used in conjunction with physical cooling measures.<sup>28</sup>

An appliance (Fig. 2) has been found useful to facilitate inspiratory and expiratory chest movements in the treatment and prevention of atelectasis, and its regular use in cases which have been weaned from the respirator and still have some remaining weakness of the respiratory muscles is considered to be of benefit in avoiding pulmonary complications. This appliance, obtainable at

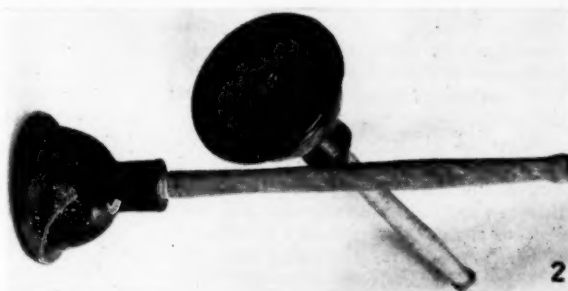


Fig. 2. Suction appliance.

hardware stores, is normally used to clear drains. It consists of a hollow rubber hemisphere with a diameter of 3-4 inches, attached to a handle. If the edges are covered with vaseline, a very good suction purchase can be obtained on the chest wall when all the air in the hemisphere is driven out by pressure on the chest wall. A pair of these suction bells can be placed on corresponding sides of the chest and alternating pressure and suction can be applied to apices and bases to synchronize with the IPPR or spontaneous respirations. By means of this appliance large areas of collapsed lung have been aerated when repeated bronchoscopy had failed to achieve this.

#### *Assessment of Respiratory Function during IPPR*

The first necessity is to be able to measure the expired air with a spirometer. Provided the correctly calculated minute-volume is being implemented at a suitable respiratory rate, the most important factor in correct maintenance has been established.

A conscious patient will usually indicate anxiety or discomfort if he is being under-ventilated or over-ventilated.

The clinical signs of under-ventilation, and excessive carbon-dioxide retention may be protean,<sup>29</sup> and for this reason, particularly with unconscious patients,



chemical estimations are necessary. For example, hypercapnoea may be present with a raised, a lowered or a normal blood-pressure, and respiratory alkalosis and respiratory acidosis may present a similar clinical picture.

Estimations of carbon-dioxide concentrations in expired air provide a useful way to regulate the volume of ventilation required, provided certain conditions appertain. The ventilation, including the tidal and minute volumes, must be consistent; if any change is made in the ventilation it takes about 20 minutes for the alveolar carbon dioxide to become stabilized at the new level.

The validity of these estimations should be monitored by calculating the carbon-dioxide tension in the arterial blood. This involves an estimation of the carbon-dioxide combining power and blood pH. From these values the carbon-dioxide tension can be found by using the Henderson-Hasselbach equation.

In the event of consolidation or collapse affecting a lung, the relation of the concentrations of carbon dioxide and oxygen in the blood will be altered. Because carbon dioxide is 25 times more soluble than oxygen, it will always diffuse through the alveolar membrane with greater efficiency when air is being respired, whatever pathological conditions are present. If gaseous exchange is stationary in part of a lung, owing to collapse of a segment, oxygenation cannot increase in efficiency through the functioning alveoli to any great extent, but the carbon dioxide which has failed to diffuse through the collapsed segment will increase the carbon-dioxide pressure-gradient through the functioning alveoli, and carbon-dioxide diffusion efficiency will increase there. It is therefore possible to maintain respiration with air to such a degree as to reduce the blood carbon-dioxide tension below normal, and yet the patient can remain incompletely oxygenated.

For these reasons it may be concluded that, when a pathological condition of the lungs arises, or when high-oxygen mixtures are being used to maintain respiration, it is necessary to determine the values of both the carbon-dioxide and oxygen tensions in the blood to control the respiratory function adequately. An oximeter is a useful instrument with which to regulate respiratory adequacy. If air alone is being used for IPPR, and the oxyhaemoglobin saturation is kept consistently above 95%, then it can be assumed that the carbon-dioxide levels in the blood will not be excessive.

Frequent estimations of blood electrolytes and carbon-dioxide combining power are unnecessary. Since carbonic acid contributes only about 2-3 volumes of carbon-dioxide to the normal 60 volumes in 100 ml. of blood, significant respiratory acidosis may occur without an appreciable change in the total carbon-dioxide content. Over-ventilation on the other hand, sufficient to cause tetany in a conscious subject, will cause the carbon-dioxide combining power to be little changed.<sup>30</sup>

#### CASE HISTORY

A little girl aged 6 years was admitted on 22 September 1956 with poliomyelitis associated with severe paralysis of the arms, legs, back and neck.

A tracheotomy was done on the following day under general anaesthesia, to attempt to improve her respiratory function by reducing the dead-space volume by half, and because weakness of swallowing was present.

As the initial general improvement following tracheotomy was not maintained, IPPR was instituted with a Dräger Poliomat. This method was used for 1 week, during which time the patient's general condition was very poor. She was semi-comatose, the pulse was very rapid and variable, and the blood pressure equally variable, ranging from 150/90 mm. Hg to unrecordable figures. On many occasions when her condition was deteriorating, immediate improvement was made on removing the Poliomat and maintaining ventilation by the manual compression of a reservoir bag.

After a week, when death appeared imminent, the use of the Poliomat was dispensed with entirely, and the manual compression of a reservoir bag continued, 100% oxygen first being used, and later progressively larger proportions of air. Humidification was carried out with a thermostatically controlled humidifier, and carbon dioxide eliminated, at first by a soda-lime canister and later by the use of a flow of gases of 10 litres per minute.

Bronchial infection was minimized by insufflating the bronchi every third day with streptomycin dissolved in an Alevaire nebulizer included in the circuit, and by the use of oral penicillin.

Atelectasis of the left lung occurred, and was relieved by the use of the suction appliance described in this paper, after repeated bronchoscopy had failed to do so.

Nutrition was maintained by supplying the estimated calorie and fluid requirements in a gastric feed introduced *via* a Ryle's tube through the nose into the stomach.

The patient was maintained on this regime for a further two weeks. Spontaneous breathing then returned, and after a few days she was able to breathe herself for most of the day. She has continued to have active physiotherapy, with the use of the 'bell suction' and graded exercises.

At the present time, after 10 weeks, she appears very well, and has regained the use of both arms, and there is some recovery of both legs, although very incomplete.

#### DISCUSSION

In this case, IPPR was maintained with the simplest means, the merits of which have already been discussed. The main purpose of this discussion is to evaluate the Dräger Poliomat.

We have tried this machine on both adults and children, and it has been consistently unsatisfactory in our hands. It possesses very few of the requirements of a satisfactory IPPR machine. There is no means of measuring the tidal volume delivered to the patient. The inspiratory and expiratory phases are not capable of independent adjustment in so far as time or pressures are concerned. When running at inspiratory pressures of + 15 cm. water, the negative expiratory pressure is excessive at -10 cm. water. If the pressure wave-form is examined<sup>31</sup> it will be seen that the inspiratory pressure-wave builds up to a gradual peak, which is reached in no less than half way through the respiratory cycle. It takes over 2/3rds of the duration of the respiratory cycle before the mean intrathoracic pressure is allowed to fall to atmospheric pressure when the respiratory rate is 20 per minute.

The humidifier incorporated in the Poliomat is of doubtful efficiency.<sup>31</sup>

In practice, the impression is given that this machine is unable to deliver the required minute-volume unless excessive rates or pressures are used; in other words, the tidal volume delivered with each stroke is deficient, and this is supported by the deficiency of the pressure wave-form as outlined by Spalding and Young.<sup>8</sup>

IPPR  
propor  
case. T  
the fac  
and e  
includi  
with th  
patient  
these u  
hazard

Both  
effect o  
normal  
side of  
minimi  
pressur  
IPPR.  
cases tr  
respirat  
The av  
11 wee  
owing t  
10 pati  
tetanus  
and tet  
of poli  
of such  
in spite  
shortly  
17 wee  
2 cases  
7 and 1

In ca  
spinal  
IPPR h  
little b  
bulbosp  
Hospita  
the Eng  
this co  
similar  
1950),  
necessa  
approxi

Some p  
in the  
respirat

At the ar  
of the M  
Johannes  
1956, Dr  
the title o  
A vote  
for his se

\* Publ



## CONCLUSION

IPPR presents many problems, which increase in proportion to the time it is applied to any individual case. The best results are obtained in special units where the facilities and personnel with the necessary training and experience are available. In many countries, including Britain and the Scandinavian countries, teams with the necessary equipment are available to transport patients in need of such treatment by road and air to these units. The hazards of transport are less than the hazards of treating such patients with inadequate means.

Both tank respirators and IPPR machines have the effect of reducing the venous pressure-gradient, which normally operates to facilitate venous return to the right side of the heart. It is found desirable in order to minimize this effect, but not essential, to add a negative-pressure phase during expiration in the application of IPPR. Spalding and Young<sup>8</sup> report 10 consecutive cases treated by a Radcliffe or similar gravity-operated respiratory pump, *without the use of negative pressure*. The average duration of treatment was approximately 11 weeks. Only one case died during this treatment, owing to inhalation of vomit before admission. Of the 10 patients, 4 were cases of toxic polyneuritis, 1 of tetanus, and 5 of poliomyelitis. The cases of polyneuritis and tetanus all made satisfactory recoveries. The cases of poliomyelitis however, illustrate the poor prognosis of such cases with severely paralysed respiratory muscles, in spite of an efficient respirator. Of the 5 cases, 1 died shortly after admission from inhaled vomit, 2 died 10 and 17 weeks after cessation of IPPR, and the remaining 2 cases were still under treatment with IPPR after 7 and 12 months.

In cases of bulbar poliomyelitis, where the muscles of spinal segments are not necessarily severely affected, IPPR has been found of most use and the outlook is a little brighter. In Sweden during 1954, 55 cases of bulbospinal poliomyelitis were treated at the Stockholm Hospital for Infectious Diseases with tracheotomy and the Engström respirator. The mortality was 27% and this compares very favourably with the mortality in similar cases in previous epidemics in Sweden (1949 and 1950), where cuirass respirators, supplemented if necessary by tracheotomy, produced a mortality of approximately 85%.<sup>19</sup>

## SUMMARY

Some physiological problems that have to be considered in the application of intermittent-positive-pressure respiration are discussed.

The volumes, composition and pressure wave-forms used during IPPR are evaluated, and some practical points and complications during treatment are mentioned.

A useful appliance has been described to facilitate physiotherapy, and a short case-history recorded.

I should like to thank Dr. J. D. M. Barton and Dr. H. A. Kalley, consultant anaesthetists to Grey's Hospital, Pietermaritzburg, for their advice and assistance, and the poliomyelitis team for permission to publish the case.

## REFERENCES

1. Russell, W. R., Shuster, E., Smith, A. C. and Spalding, J. M. K. (1956): *Lancet*, **1**, 539.
2. Affeldt, J. E., Collier, C. R., Crane, M. G. and Farr, A. F. (1955): *Curr. Res. Anesth.*, **34**, 41.
3. Fenn, W. O., Rahn, H. and Otis, A. B. (1946): *Amer. J. Physiol.*, **146**, 637.
4. Scurr, C. F. (1956): *Brit. J. Anaesth.*, **28**, 23.
5. *Idem* (1956): *Ibid.*, **28**, 422.
6. Dobkin, A. B., Hubay, C. A., Mendelsohn, H. J. and Hungen, R. A. (1956): *Brit. J. Anaesth.*, **28**, 296.
7. Radford, E. P. (1955): *J. Appl. Physiol.*, **7**, 451.
8. Spalding, J. M. K. and Young, S. A. (1955): *Lancet*, **2**, 227.
9. Maloney J. V., Brown, E. S. and Ten Pos, R. H. (1953): *J. Amer. Med. Assoc.*, **152**, 212.
10. Waltz, R. C., Hubay, C. A., Ankeney, J. L. and Merrill, J. (1954): *Surg. Gynec. Obstet.*, **99**, 580.
11. Esplen, J. R. (1956): *Brit. J. Anaesth.*, **28**, 176.
12. Harbord, R. P. (1955): *Ibid.*, **27**, 146.
13. Horton, J. A. G., Inkster, J. S. and Pask, E. A. (1956): *Ibid.*, **28**, 169.
14. Lassen, H. C. A. (1953): *Lancet*, **1**, 37.
15. Fry, R. (1955): *Brit. J. Anaesth.*, **27**, 260.
16. Macrae, J., McKendrick, G. D. W., Sefton, E. M. and Walley, R. V. (1954): *Lancet*, **2**, 21.
17. Harries, J. R. and Lawes, E. W. (1955): *Brit. Med. J.*, **1**, 448.
18. Hay, P. (1954): *Lancet*, **2**, 1156.
19. Engström, C. (1954): *Brit. Med. J.*, **2**, 666.
20. Marshall, J. and Spalding, J. M. K. (1953): *Lancet*, **2**, 1022.
21. Pinkerton, H. H. (1955): *Anaesthesia*, **10**, 310.
22. Hewer, C. L. (1953): *Recent Advances in Anaesthesia*, 7th ed., p. 343. London: Churchill.
23. Beecher, H. K. and Murphy, A. J. (1950): *J. Thorac. Surg.*, **19**, 50.
24. Borach, A. L. and Beck, G. J. (1954): *Amer. J. Med.*, **16**, 55.
25. Hubay, C. A., Brecher, G. A. and Clement, F. L. (1955): *Surgery*, **38**, 215.
26. Lassen, H. C. A. (1954): *Proc. Roy. Soc. Med.*, **47**, 70.
27. McBurrows, M., Dundee, J. W., Francois, I. L. L., Lipton, S. and Sedzimer, C. B. (1956): *Anaesthesia*, **2**, 4.
28. Delmore, E. J. (1956): *Ibid.*, **2**, 222.
29. Lawes, W. E. (1956): *Brit. J. Anaesth.*, **28**, 32.
30. Robson, J. S. (1954): *Principles and Practice of Medicine*, 2nd ed., p. 689. Edinburgh: Livingstone.
31. Mesham, P. R. W. (1955): *S. Afr. Med. J.*, **29**, 1013.

## ASSOCIATION NEWS : VERENIGINGSNUUS

## ANNUAL MEETING OF THE SOUTHERN TRANSVAAL BRANCH

At the annual general meeting of the Southern Transvaal Branch of the Medical Association of South Africa, which was held in Johannesburg on 19 February 1957, the outgoing President for 1956, Dr. Cyril Adler, delivered his valedictory address under the title of "Quo Vadis".

A vote of thanks was accorded with acclamation to Dr. Adler for his services as President and for his address. On the motion

of Dr. Adler, votes of thanks were also passed to Dr. Lewis S. Robertson and Dr. Maurice Shapiro, and to Mr. J. Wolfowitz (Hon. Treasurer), Mr. W. Girdwood (Hon. Secretary), Dr. J. Gluckman (Hon. Assistant Secretary), Dr. H. A. Shapiro (Secretary, Press Liaison Committee), and the members of the administrative staff.

Dr. Adler thanked all members of the Branch and the Branch Council, and of the administrative staff, for their loyal support during his term of office.

\* Published in this issue p. 230.

## TURNER'S SYNDROME IN THE MALE

W. P. U. JACKSON, M.A., M.D., M.R.C.P., D.C.H.

R. HOFFENBERG, M.B., M.R.C.P.

*From the Endocrine Clinic, Department of Medicine, Groote Schuur Hospital and the University of Cape Town*

Turner's syndrome, as originally described in the female, consisted of 3 main features: (1) shortness of stature, (2) sexual infantilism, and (3) congenital anomalies, particularly skeletal.<sup>21</sup> Our concept of the syndrome has widened considerably and it is now known as 'Gonadal dysgenesis'.<sup>8</sup>

In 1938, Turner published reports of 7 females who showed the features mentioned above. The skeletal anomalies included particularly cubitus valgus and webbing of the neck.<sup>21</sup> American authors postulated a primary ovarian failure as the cause of the infantilism in this syndrome.<sup>1,22,23</sup> This suggestion was supported by the finding of high urinary gonadotrophin excretion and, later, by the demonstration of vestigial primitive gonadal ridges in these patients. The syndrome subsequently became known as 'ovarian agenesis'. Despite their apparent femaleness, most of these patients have, in fact, the nuclear (probably chromosomal) pattern of the male.<sup>2,3,4,8,13,14,24</sup> We believe they are 'genetic males'. Because of indecision about the true nature of these gonadal ridges, and because some of these gonads show histological evidence of slight maturation, the syndrome is now referred to as 'gonadal dysgenesis'.<sup>8</sup>

In almost all cases described, the body-form is female, although a recent report indicates that pseudo-hermaphroditic forms may exist.<sup>8</sup> We can find reference to few instances of Turner's syndrome (i.e. hypogonadism, shortness of stature and congenital anomalies) occurring in the anatomical male.<sup>5,6,7,9,11,12,15,16,17,18,19,20</sup> Because of its rarity, we report the first two cases. One patient (case 1) has been previously described<sup>20</sup> and his protocol will be very briefly summarized here. The third case to be described is not yet old enough for us to know whether he will be hypogonadal or not.

*Case 1. Coloured male aged 30 years (Fig. 1 and 2)*

Height 58½ inches; marked webbing of the neck; no cubitus valgus; excellent muscular development. He had a large phallus, but denied sexual feelings, and had never had an erection or an emission. Urinary gonadotrophin (FSH) excretion was positive at 96 mouse uterine units (a very high figure) but a testicular biopsy was not available.

*Case 2. Coloured male aged 14 years (Fig. 3)*

He was under sized from birth and had not shown any signs of pubertal development. He had asymmetrical

eyes with marked epicanthic folds, a high arched palate, minute nipples, webbing of the neck, and hypoplasia of several interscapular muscles. His penis and gonads were infantile. FSH excretion was negative at 12 m.u. on two occasions.

Bilateral testicular biopsies showed histologically infantile testicular development, as normally seen in the first 6 years of life (Dr. C. J. Uys).

The skin showed male nuclear pattern.

*Comment*

Case 1 may be regarded as an example of Turner's syndrome in the male, showing the congenital anomalies,

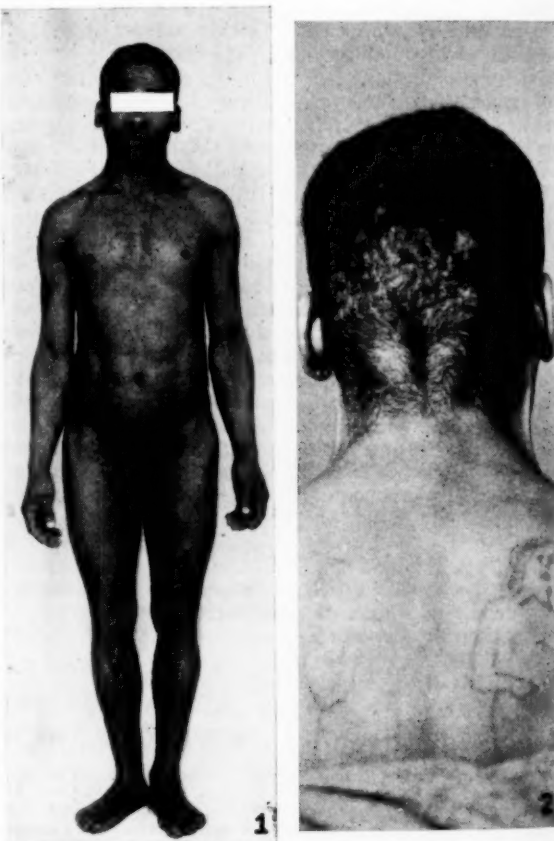


Fig. 1. Case 1. Note stocky build and large phallus (Brit.)

Fig. 2. Case 1. Marked webbing of neck. (both figures reproduced, by permission, from *Brit. Med. J.* <sup>20</sup>).

Fig. 3

shortness of stature and hypogonadism with high FSH excretion.

Case 2 shows the anomalies, shortness of stature and gonadal immaturity. If the infantilism persists, it may be presumed that higher FSH levels will be found in later years. One should not infer too much from the lack of testicular development, but histologically this was certainly very poor for the age of 14.

These and other reported cases (i.e., of 'male Turner's syndrome') in the literature have all shown analogy to the 'female' form of Turner's syndrome in their shortness of stature and congenital anomalies. Furthermore, all had some type of gonadal disturbance, as shown either by testicular biopsy or abnormal FSH levels. The reported histological abnormalities in the testes have been very variable—nevertheless there

seems to be sufficient evidence to justify the inclusion of these patients in a special group.

*Case 3. Coloured male aged 6 (Figs. 4 & 5)*

Height 40 inches, weight 34 lb. This small, bright boy possessed a webbed and very short neck, with a low nuchal hair-line. Other anomalies included facial asymmetry, epicanthic eyefolds, a right fifth finger fixed in flexion, and glandular hypospadias. The right scapula was smaller than the left and the right serratus anterior was missing. Despite this, the right scapula actually 'winged' less than the other on pushing forward, indicating its fixation to the chest wall. Abduction at both shoulders was grossly limited. X-Rays confirmed the smallness of the right scapula, and showed that a number of cervical vertebrae were fused.



Fig. 3. Case 2. Note facies and webbed neck.



Fig. 4. Case 3. Short neck, facial asymmetry. The arms are in maximum abduction.



Fig. 5. Case 3. Low hairline, asymmetrical scapulae, flexed right fifth finger. Note fixation of right scapula to trunk on the child's pushing against the wall.

#### Comment on case 3

Although we do not yet know whether any testicular abnormalities will supervene, this boy shows the shortness and many of the anomalies associated with Turner's syndrome. Rossi and Caffisch, as well as other European authors, have paid more attention to the skeletal anomalies than to the gonadal ones, and talk of the 'pterygium syndrome', to embrace the various anatomical pictures. Some of their cases were hypogonadal, while others were not. While, therefore, we may see the gonadal anomaly in women who are quite normal physically, it seems likely that the physical anomalies may occur in others who are normal gonadally.

#### DISCUSSION

It is plainly difficult to fit Turner's syndrome in the male into any aetiological theory. It would seem that the complete syndrome with female body-form may manifest male or female nuclear ('genetic') sex. If this be so, we may ask why most of the affected 'male' embryos develop a female body-form and so few retain their male anatomical development. It is suggested that all embryos assume a female body-form if they are deprived of gonadal function at an early stage of intra-uterine life. In 'Turner's syndrome in the male' we suspect that the aberration which causes the shortness, infantilism and congenital anomalies affects these genetic male individuals at a later stage of embryonic development. By

this time some irreversible male differentiation will already have occurred; the final result, as in the first two cases, is the unusual one of 'gonadal-dysgenesis-with-male-body-form'.\*

#### SUMMARY

This paper considers the condition of 'Turner's syndrome in the anatomical male' and its relation to the more usual forms of gonadal dysgenesis (ovarian agenesis). Two cases of the full syndrome are reported and an attempt is made to fit the condition into an aetiological theory. A third patient is discussed, who is as yet too young to show evidence of testicular dysgenesis, but who shows other characteristic features.

We thank Prof. J. F. Brock and Prof. F. Forman for their stimulating interest, Prof. H. Zwarenstein and Mr. D. G. Duncan for the FSH determinations, Dr. C. J. Uys for the pathological reports, and Mr. B. Todt for the photographs. Dr. Sougin Mibashan kindly allowed us to report case 1.

\* For fuller discussion of the general theory of gonadal dysgenesis and intersex see Grumbach *et al.*<sup>8</sup> and Hoffenberg and Jackson.<sup>10</sup>

#### REFERENCES

1. Albright, F., Smith, P. H. and Fraser, R. (1942): *Amer. J. Med. Sci.*, **204**, 625.
2. Carpentier, P. J., Stolte, L. A. M. and Visschers, G. P. (1955): *Lancet*, **2**, 874.
3. Carpentier, P. J., Stolte, L. A. M. and Visschers, G. P. (1956): *J. Clin. Endocr.*, **16**, 155.
4. Davidson, W. M. and Smith, D. R. (1954): *Brit. Med. J.*, **2**, 6.
5. Dorff, G. B., Appelman, D. H. and Liverson, A. (1948): *Arch. Pediat.*, **65**, 555.
6. Flavell, G. (1943): *Brit. J. Surg.*, **31**, 150.
7. Greenblatt, R. B. and Nieburgs, H. E. (1948): *J. Clin. Endocr.*, **8**, 993.
8. Grumbach, M. M., Van Wyk, J. J. and Wilkins, L. (1955): *Ibid.*, **15**, 1161.
9. Halonen, P. I., Seppälä, T. and Hakkila, J. (1956): *Acta med. scand.*, **43**, 427.
10. Hoffenberg, R. and Jackson, W. P. U. (1957): *J. Clin. Endocr.* (in publication).
11. James, T. (1952): *Edin. Med. J.*, **59**, 344.
12. McCullach, E. P. (1948): Quoted by Sohval, *loc cit.*<sup>18</sup>
13. Moore, K. L. and Barr, M. L. (1955): *Lancet*, **2**, 57.
14. Polani, P. E., Hunter, W. F. and Lennox, B. (1954): *Ibid.*, **2**, 120.
15. Prunty, F.T.G., McSwiney, R. R. and Clayton, B. E. (1953): *J. Clin. Endocr.*, **13**, 1940.
16. Reforzo-Membrives, J., Trabucco, A. and Escardo, F. (1949): *Ibid.*, **9**, 1333.
17. Rossi, E. and Caffisch, A. (1951): *Helv. Paediat. Acta*, **6**, 119.
18. Sohval, A. R. in L. J. Soffer, L. G. (1951): *Diseases of the Endocrine Glands*. Philadelphia: Lea and Febiger.
19. Solis, J. and Schwartz, M. M. (1951): *Rev. med. Rosario*, **41**, 3.
20. Sougin-Mibashan, R. and Jackson, W.P.U. (1953): *Brit. Med. J.*, **2**, 371.
21. Turner, H. H. (1938): *Endocrinology*, **23**, 566.
22. Varney, R. F., Kenyon, A. T. and Koch, F. C. (1942): *J. Clin. Endocr.*, **2**, 137.
23. Wilkins, L. and Fleischmann, W. (1944): *Ibid.*, **4**, 357.
24. Wilkins, L., Grumbach, M. M. van Wyk, J. J. (1954): *Ibid.*, **14**, 1270.



## A REPORT ON A CLINICAL TRIAL OF A NEW OPAQUE MEDIUM FOR CHOLECYSTOGRAPHY

J. J. GEERE, B.Sc., M.B., B.Ch., D.M.R.D.

and

B. T. HOOPER, M.B., F.R.C.S.(E), D.M.R.E.

*Radiologists, Port Elizabeth*

A clinical trial was carried out on 50 unselected cases referred to the writers for cholecystography with a new opaque medium, phenobutiodil, which will shortly be marketed under the trade name Biliodyl.

The compound was synthesized in France by Redel, Maillard and Cottet<sup>1</sup> (1954); it was originally known as 4114 T.H., and chemically is 1-(2:4:6-Triiodophenoxy)-butyric acid. It has a molecular weight of 557.9, contains 68.2% of iodine and is a yellowish-white odourless powder with a slightly bitter taste. The oral lethal dose (LD<sub>50</sub>) in mice is stated to be greater than 5 g. per kg. and the intravenous lethal dose is about 206 mg. per kg. It is eliminated in both the faeces and the urine.

Phenobutiodil is available as tablets of 0.5 g. In the present series a dose of 3 g. was employed in all 50 cases. Lehman, Jouan and Cottet<sup>2</sup> (1954) used an average dose of 4.5 g. in 57 cholecystographies. Their reported incidence of nausea was rather high and, as information was to hand that satisfactory results had been obtained in England with 3 g., it was decided to try this dose initially; it produced excellent opacification in the very first case and it was thereupon decided to employ it for the entire series.

Visualization of the gall-bladder was classified as excellent, good, poor or *nil*. Each case was graded purely on our subjective impression; densitometric evaluation was not feasible in patients of such wide diversity of weight and girth as were encountered and for whom wide variations of X-ray exposure technique were required.

Of the 50 cases, concentration was classified as excellent in 27, good in 17, poor in 3 and *nil* in 3. Of the 44 cases classified as showing excellent or good concentration 39 had normal gall-bladders; the other 5 had varying numbers of non-opaque biliary calculi and these were in all cases quite obvious. In no case was concentration so dense that one felt that the danger existed of missing a small non-opaque calculus as a result of this.

In the 6 cases which showed poor concentration or none, repeat examinations were carried out with triiodo-ethionic acid (Teridax). In 4 of these the results were again classified as poor concentration or none. They were then diagnosed as cases with non-functioning or nearly non-functioning gall-bladders in which non-opaque calculi could not be excluded by cholecystography. Surgical confirmation of a pathological gall-bladder containing numerous calculi has been obtained in one case, 2 cases are awaiting operation, and the 4th is the case of an old lady in very poor physical condition for whom operation was considered inadvisable.

In the other 2 cases, who attended for their straight

X-ray films and were handed their tablets on the same date, no concentration had occurred the next morning and the opaque medium was evident in the stomach and upper small-bowel in both. It seems that in both cases the instructions were not properly carried out and that the tablets were taken in the morning shortly before the examination instead of 12 hours earlier the previous evening. In both, repeat examination was carried out with triiodo-ethionic acid and both then showed good concentration of the opaque medium with no evidence of calculi or other pathological changes in the gall-bladder.

In 18 of the cases some visualization of the cystic or hepatic ducts occurred. This was equal to 36% of the total and much lower than the figure claimed by Lehman *et al.* This may be partly due to the fact that the routine film done after the fatty meal was taken 90 minutes after the commencement of the meal; had it been done at 20 or 30 minutes a much higher proportion of cases would probably have shown some filling of the ducts. As, however, it is our experience that gall-bladder contraction is not nearly as good at 20 or 30 as at 90 minutes, and as the primary object was investigation of the gall-bladder and not of the bile ducts, it was not considered necessary to take films at 20 minutes as well as 90 minutes after the fatty meal.

Side-effects were almost absent on the routine dose of 3 g. of phenobutiodil. Of the 50 cases, 4 (i.e. 8%) complained of mild or moderate nausea, but in no case was vomiting reported. 2 cases (i.e. 4%) had mild or moderate diarrhoea; one of these had also complained of mild nausea. No other side-effects were stated to have occurred and in particular no patient complained of dysuria. It is probably worthy of note that in the 4 cases where mild nausea or diarrhoea occurred and in the one where both were reported, concentration of the opaque medium was classified as excellent or good. The patient who complained most of a feeling of nausea also proved to have a gall-bladder full of non-opaque calculi.

Finally, in very few cases was any appreciable trace of opaque medium visible in the bowel 14 hours after the tablets had been taken, and in no case did any interference with visualization of the gall-bladder occur. In this respect, the results compared favourably with those of iopanoic acid. In our experience the latter has a definite tendency to be incompletely absorbed, and often somewhat dense residues of the opaque medium are present in the proximal colon at the time when the film of the filled gall-bladder is done. It has been felt that this might be responsible for confusion in the interpretation of shadows. Iopanoic acid also produces

a very dense shadow in the gall-bladder—so much so that the possibility that a small non-opaque calculus might be missed in the dense shadow cannot be ignored.

#### SUMMARY

A trial of phenobutidil in 50 cases referred for cholecystography has been carried out. The standard dose employed, viz. 6 tablets (3 g.), appeared to be sufficient for patients of average build and weight. The shadow produced was of adequate density for diagnostic purposes but not so dense that one felt that the danger

existed that a small non-opaque calculus might be missed. With the dose employed the incidence of unpleasant and undesirable side-effects was very low, and our impression was that the preparation was a very satisfactory contrast medium for cholecystography.

#### REFERENCES

1. Redel, J., Maillard, J. and Cottet, J. (1954): Bull. Soc. chim. Fr., 3, 342.
2. Lehman, R., Jouan, F. and Cottet, J. (1954): Presse méd. 6, 123.

#### QUO VADIS?\*

CYRIL ADLER, M.B., B.Ch., D.Phys.Med.

*President, Southern Transvaal Branch, Medical Association of South Africa, 1956*

One wonders why a valedictory address by the retiring President of a Branch was introduced and what is expected of the President in such an address. I have tried to analyse the possible reasons, and what is expected, and I have come to the conclusion that it may have been introduced in order to provide an occasion, the only occasion, on which the retiring President may have an opportunity of presenting to the members of his Branch matters that may be of concern or importance to the Branch in particular or the Association in general.

It is for this reason that I have adopted for my address a subject of deep concern to all of us, that of the Medical Association in relation to its own functions, and those of the South African Medical and Dental Council in relation to the Medical Profession. I have chosen 'Quo Vadis?' as the title because I am not quite sure where we are going and—what is perhaps more important—what is the ultimate destination of the medical profession, and the results of the activities of the Medical Association.

My year of office, 1956, has often given me grave concern as a member of the Association, as a member of the Council of this Branch, and as a member of Federal Council. This concern was brought still nearer home to me in my capacity as President of this Branch. In this capacity I have often been embarrassed, and sometimes even felt a sense of frustration; and I want to make use of this occasion to unburden my soul.

#### A VOLUNTARY ASSOCIATION

The membership of the Medical Association is high, but is not a 100% membership. The Association is a voluntary organization, and one is not unduly perturbed by the fact that not every medical practitioner in the Union is a member. If they had all been members, it would certainly have strengthened the hands of the Association, but there is strength also in a voluntary organization, in that every member submits himself voluntarily to the rules or discipline of that organization. There is no legal obligation, such as exists in some other professional bodies, for every doctor to be a member, but I make bold to say that every doctor who is worth his salt is a member of the Medical Association of South Africa.

What of our Association? It has well-defined policies covering the scientific aspects of medicine, as well as its economic and social aspects. It has rules, too, to cover disciplinary issues that may arise from time to time.

The scientific side has been handled most satisfactorily by the Groups within the Association, each group catering more specifically with the needs, demands, and interests of its own section. In the past these groups may have restricted their meetings to their own members, but of late some have thrown them open to all members of the profession. Scientific lectures and clinical demonstrations are provided at general meetings of the Branch by visiting lecturers as well as local members.

\* Valedictory Presidential Address delivered on 19 February 1957.

This Branch Council has extended its activities by the issue of a periodical newsletter to advise members of Branch meetings, and Group meetings as well as important Association matters.

Opportunities for members to meet socially are provided by the annual ball and the annual dinner.

#### THE ECONOMIC FRONT

On the economic front, the Branch exercises constant vigilance and, whenever necessary and possible, appropriate action is taken. It is on this aspect that there has arisen some unhappiness and discontent, and it would be as well if we tried to seek the possible causes and perhaps suggest possible remedies.

It must be accepted that the economic aspect of the practice of medicine has grown in importance and that, with the passing of years, this Association has sometimes found itself—and it still is—ill-equipped to deal with the difficulties as they arise. One must accept too that, willy nilly, the way a doctor shall practise his art and under what conditions, and how he and his family shall live and be provided for, has, to a large extent fallen from the hands of the doctors into the hands of lay organizations, such as medical aid societies, benefit societies, insurance schemes, etc. In private practice, the doctor has to some extent been able to deal with the economics but, with the passage of time, more and more people have become associated with more and more medical aid and benefit schemes, until there is now comparatively little left of private practice as we knew it some years ago.

No body is more appreciative of the cost of the medical services than the medical man himself, and it is for that very reason that, as a body concerned with the health of the community, the medical profession has accepted schemes which provide medical aid to those who are not well able to afford the costs of private treatment. The profession accepts wholeheartedly any scheme which provides adequate medical services for those in need of such services.

What has been the result of these accepted principles?

#### LAY CONTROL OF MEDICAL PRACTICE

The patient is certainly receiving a service, but the doctor has found that in providing that service, he is now in the position where his living is being controlled by lay organizations and the standard of his living is, in most cases, no longer commensurate with his status, his knowledge, his experience, and the time he devotes to his patients. What has been created is a type of monopoly on the part of the consumer, i.e., the layman, who whether it is right or wrong for him to do so, is dictating how a professional service should be rewarded, and we have seen in recent years that this has meant a steady and growing disproportion between the cost of living and the remuneration for medical services.

The Medical Association of South Africa has assumed the function of dealing with the economics of medical practice, and unless it can judiciously and effectively make its voice heard,

then the confidence of the individual member in the Association will be seriously undermined. It must take immediate and effective action to remedy the position, and the one action which to my mind would to some extent have assisted towards overcoming this dilemma, was the organization of an Insurance Scheme as was envisaged and approved by the Federal Council. The purpose of the proposed scheme was for the Association to sponsor a scheme to be controlled by the profession itself, and which would provide services equitable to the patient and the doctor. This scheme received enthusiastic support in the Branch by members and, perhaps what is more important, by large sections of the public. Letters were received from large organizations anxious for details in order that they might give support by enlisting thousands of members seeking medical aid. Many months of laborious work was carried out by a Special Subcommittee comprising several members of this Branch, this Committee having been delegated to plan the inauguration of such a scheme. This project was later taken out of the hands of this Subcommittee, and the whole scheme is now in the melting pot with a possibility of being totally abandoned.

I wish to reiterate that today the majority of patients belong to Benefit Schemes and that we, the doctors, are largely at the mercy of these lay organizations

#### MEDICAL AID TARIFF

Another point which comes to my mind is that the acceptance of a uniform tariff of fees for medical aid societies which operates for the country as a whole is an absurdity. The running costs and conditions of medical practice vary tremendously in each individual centre and, in fact, may vary within a few miles of a large centre. An equitable tariff should be assessed for each centre and should be commensurate with local conditions pertaining to that area. To arrive at such an equitable tariff under such varying conditions would of necessity entail an analysis of all the factors governing medical practice.

In this regard, it would be just as well to comment briefly on the policies which are laid down by Federal Council.

The economic pressure governing medical practice is not homogeneous throughout the country, and it must be obvious that it cannot be expected that all representatives on Federal Council are able to appreciate fully the difficulties which may exist in areas other than in those in which they themselves practise. The greatest concentration of industry and population is on the Reef, yet policies may be debated upon and decisions taken by those of us who cannot possibly be expected to know all the factors governing the matters under discussion.

One is most appreciative of the work and endeavours of those who give their time in an honorary capacity, whether in Divisions or in Branches or in Federal Council, to Medical Association affairs.

The Federal Council, as its name implies, can have no independent existence apart from the Branches which constitute the Association. It appears to me that there has been a progressive whittling away of the authority and autonomy of the individual Branches, who alone are able to manage their own affairs and should have the predominant say in them, particularly in matters which ultimately affect regional economic problems. The solution does not lie, as I have said, in criticism of the actions of the Councils of the Association but rather, I feel, in giving greater autonomy to those who have to cater for the particular needs and conditions in particular areas—regional problems necessitate regional solutions.

My concern is not to seek a scapegoat to be blamed for the sorry pass to which the economics of medical practice has come. It is rather to explore what is the just and effective way to remedy the parlous plight of the profession, a situation which has become intolerable and which threatens the very basis of medical practice, and the status of perhaps the largest professional group in our country.

#### APPOINTMENTS

I should now like to refer briefly to Rule 19 of the South African Medical and Dental Council's Rules. These rules in essence provide that all appointments with the exception of certain Government appointments must be advertised in the public Press and in a South African medical journal. The contract of appointment should set out clearly the services which the medical practitioner

agrees to render as well as the fees or remuneration which will be payable by the party appointing. The contract should provide that the medical practitioner should receive fees or remuneration for the services which he renders only to the party whom he has contracted, and also that the fees or remuneration shall be on a basis which is not derogatory to the medical profession nor inimical to the interests of the public.

This Rule was submitted by the South African Medical and Dental Council to the Medical Association for its comments and advice in regard to its acceptance or possible amendments. The Branch debated the implications of this Rule very fully at a recent meeting.

It must be recognized that the Medical Council is a statutory body designed primarily to safeguard the interests of the public and not only to safeguard the interests of the medical profession.

In the first place, the opinion has been expressed, within Medical Council itself and outside it, that the validity of this Rule may be in question, and that should a complaint be made on the basis of the Rule, it is doubtful whether any legal action could be taken. In effect, therefore, those members of our profession who accept the validity and legality of the Rule and act ethically in accordance therewith, may find that, in point of fact, they may be the very ones to suffer, while those who choose to disregard the Rule may do so without suffering any ill effects.

We must accept, too, that the Rule itself is not without inherent dangers. An appointment may be advertised, in order under this Rule, to get rid of the incumbent in the post. It may even be accepted that not infrequently an appointment is determined before the advertisement appears in the *Journal* and that advertising of such an appointment is a mere formality.

#### PROPOSED ASSOCIATION CONTROL OVER FEES

This brings me to a very important issue which we as members of the Association must recognize and then seek a solution.

The Medical Council is not a body designed to protect the interests of the medical profession. The proper body to safeguard those interests is the South African Medical Association. It is for the Medical Association to stipulate the conditions and the terms of service and the remuneration for posts and employment which members of the profession may apply for or accept, particularly in regard to contract practice work and even for full-time appointments to Government, Provincial, University and other such organizations. The Medical Association is the *only* body which should consider the interests of its members and, in fact, the interests of the profession as a whole.

The Medical Council should not be permitted to decide what is a reasonable remuneration for members of the medical profession. It can now only assess fees in relation to what is excessive, what it considers may be too much, *not* what is too little! It is contended that the Medical Association is the proper body to decide what fees medical men should charge, what conditions of service should appertain to an appointment and what ethical standards should cover these appointments. One has the feeling that the Medical Council would be pleased to be relieved of this obligation, which its members find difficult to regulate and, even if this is not so, the Medical Council may find it has no statutory authority.

This Branch, at the meeting at which this Rule was debated, accepted the following resolution unanimously: 'That Rule 19 and Rule 19bis be expunged from the Ethical Rules of the South African Medical and Dental Council and that machinery be devised by Federal Council to control the whole question of advertisements and appointments'.

While the discipline provided for in this Rule of the Medical Council is desirable and necessary, effective action to protect the Medical Practitioners against exploitation can never be effectively taken by the Medical Council either under this or any other Rule, and the only body to do so is the Medical Association.

The Medical Association should undertake that responsibility and obligation and thus demonstrate to its members its recognition of those responsibilities, and then act accordingly, in order to ensure that its members shall enjoy reasonable conditions of service and be adequately rewarded for those services.

I do not know what steps will have to be taken to carry this into effect, whether it be as a voluntary organization or by charter. This is a matter which will have to be decided upon. It has been said that as it is a voluntary organization, it might be difficult



to administer its rules, because all that a member need do in order to escape his obligations is to resign from the Association. I am sure that there must be very few organizations which could afford to disregard the considered opinion of the Medical Association and rely exclusively for adequate medical services on non-members on whom its discipline is not binding.

To overcome these difficulties, it is apparent that the Association will have to devise some effective machinery for negotiation and for the recognition of benefit societies and medical aid societies.

I am more than ever convinced that the Medical Association should lay down the rules in regard to the acceptance of posts, with the overriding factor that such rules must not only be acceptable to the medical profession but also in the best interests of the patients. The profession itself, however, must be the final

arbiter on what is acceptable and what is not acceptable. The Medical Association must decide what is equitable in the interests of the profession, having full regard to its responsibilities to the public, and the basis of those decisions must be an honourable understanding to do only that which is in the best interests of both parties.

The Public demands the best medical services and it will only be able to obtain such services with the help of and through the Medical Association of South Africa.

I have used the title '*Quo Vadis?*' to introduce this address. Whatever may be the direction in which we go, I am satisfied that with careful planning and understanding it can only be in the right direction, compatible always with the interest of the patient as well as his doctor.

## THE MINISTER OF HEALTH AT STELLENBOSCH UNIVERSITY

By A SPECIAL CORRESPONDENT

With a change of accent to preventive medicine rather than curative medicine there were two aspects of medical training which deserved to come into their own as specialized subjects, namely, paediatrics and geriatrics, the Minister of Education, Arts and Science, and of Health, Mr. J. H. Viljoen, said at Stellenbosch last week when he formally opened the academic year of the University of Stellenbosch. He suggested the establishment of professorships in these subjects at the university's new medical faculty.

Mr. Viljoen said that nutrition played an important role in preventive paediatrics. Life started before birth and for that reason the nutrition of the expectant mother should also be given close attention.

The progress which had been made in the field of geriatrics during the past decades, had resulted in an increase in the average life span of more than 20 years compared with the average life expectancy at the beginning of this century. 'At a congress on geriatrics a few years ago it was stated that it could be expected that life expectancy would be increased to 100 years when medicine has succeeded in solving the problem of degenerative and crippling diseases to which the aged, in particular, are subject', said Mr. Viljoen. 'There are good reasons to believe that certain degenerative processes among old people are due to prolonged under-nutrition and malnutrition.'

### MEDICAL SERVICES TO NON-EUROPEANS

The Minister said it was sometimes alleged that South Africa had more than enough doctors already. This allegation was probably based on the fact that the Union had more doctors per head of the European population than any other Western country. It must be remembered, however, that the Union was also responsible for the health of 10,000,000 non-Europeans.

'As the majority of them are not in a position to pay for their medical services and there are not yet sufficient non-European doctors, the services they require are rendered mainly by European medical officers provided by the Government. It is hoped that many of the medical students who are going to qualify at this University, will choose the public service as a career. There is a wide field lying still unexplored where medical services are urgently required.'

### NEW TRENDS IN MEDICAL TRAINING

Mr. Viljoen said that in a speech at the opening of the academic year last year the Rector of Stellenbosch University, Prof. H. B. Thom urged that South Africa should take full cognizance of the new trends in training overseas, namely, that of comprehensive medicine, clinical training whereby family care was incorporated and training whereby the various medical subjects were firmly coordinated and integrated.

As far as comprehensive medicine was concerned, a feeling had arisen that medical training was apt to be academic and out

of touch with humanity. What was needed was contact with psychology and sociology. With the development of medicine and the growth of medical subjects the psychological aspects had been pushed into the background. Today a balance was being struck and a new direction—that of psychosomatic medicine—was being taken.

Diseases could be classified under 3 main heads, viz. purely biological, purely psychological, and psychosomatic, where the psychiatrist and the physician should complement one another but too often fail to do so.

It was a recognized fact that pleasant, balanced emotions promoted good health while poorly controlled emotions such as fury, vengeance, fear, jealousy, disappointment and worry could cause ill health. In some circles it was believed that it could even set up cancer processes.

'It is a doctor's task not only to determine the physical causes of a disease, but also to ascertain whether the reason for the disease is not some form of psychological conflict. If this should appear to be the case, as it often is, the doctor should attempt, through psychological influence, to draw out the inner healing powers of the patient.'

The Minister said that in view of the increasing role which psychology played in the treatment and healing processes, doctors should be well-grounded in psychology, but unfortunately their courses were so overloaded with unavoidable subjects dealing with the fundamental physical principles of disease phenomena and treatments, that they only received training in psychiatry—in other words, only in respect of blatantly abnormal psychological symptoms. The study of normal psychology had to be neglected.

### PEP PILLS

Mr. Viljoen was of the opinion that 'pep pills', 'happy pills' or tranquilizers, barbiturates and similar drugs would not be so readily prescribed if physicians had a better grounding in psychology. He thought the prescription of these remedies should be left to the discretion of specialists. Apart from the grave dangers to health and the habit-forming effects of these remedies, they offered no solution to the psychological affliction of the patient.

### FAMILY CARE

Speaking of clinical training whereby family care was incorporated, the Minister said it was essential for the aspirant doctor to become acquainted during his training with the circumstances which he would later meet from day to day in his practice. To do this it was in their natural environment that he should meet the clinical cases which he had to study.

As far as training whereby the various medical subjects were firmly coordinated and integrated was concerned, the Minister urged that lecturers and professors who had formed an attachment to special branches of medicine, should not allow such special attachment to stand in the way of cooperation with the exponents of other branches of medicine.

## COORDINATING THE NATIONAL WORK OF REHABILITATION

BY OUR PARLIAMENTARY CORRESPONDENT

A nation-wide campaign is to be launched in March or April to make employers and all other interested parties conscious of the necessity for rehabilitating the physically defective, according to an announcement in the Senate by the Minister of Labour (Sen. J. de Klerk).

He made the statement when replying to a motion by Sen. M. D. J. Koster, which read: 'That this House, in view of the declared policy of the Government of granting to all persons capable of performing useful work the opportunity of doing so, and mindful of the necessity for the effective rehabilitation of the maximum number of persons whether mentally or physically defective, is of opinion that the Government should take all practical steps to attain this end by undertaking rehabilitation schemes on its own initiative and by coordinating, with the assistance of the South African Rehabilitation Board, the services rendered in this direction by private organizations'.

Mr. de Klerk said that the rehabilitation of a defective person was a continuous process with various stages, and the work of all the welfare organizations in the country was now being co-ordinated by the South African Rehabilitation Board. Provisionally, the functions of the Board would be limited to the formation of a national rehabilitation policy, and advising the Government in regard to the comparative value of certain rehabilitation services. It would give a lead in connection with the creation of certain rehabilitation services with which more than one national body or more than one State department was concerned. It would also disseminate information about and propaganda on rehabilitation, and consider all aspects of vocational guidance and re-training aimed at placing a defective person in employment in the normal labour market or placing him in sheltered employment.

## TO ELIMINATE OVERLAPPING

Furthermore, the Board would endeavour to draft legislation to promote the interests of defective persons and to bring about better coordination. The purpose of the Rehabilitation Board was not to take over the work of national organizations rendering rehabilitation services, but to coordinate their work as well as that of the various Government departments.

'In this way overlapping can be eliminated and a joint rehabilitation plan can be tackled and carried out efficiently', said Mr. de Klerk.

The Board was composed of representatives of the provincial administrations, interested State departments and persons who had been appointed to the council on the grounds of their personal knowledge and experience of rehabilitation. At its most recent meeting the Board appointed a committee to formulate a general rehabilitation policy and to draw up a draft Bill to make provision for defective persons.

'This draft Bill will be submitted by me to the Government as soon as a gentleman's agreement has been reached with the mining industry that mineworkers who had been injured in accidents while working on a mine would be re-employed by the industry', said the Minister.

Mr. de Klerk pointed out that it was necessary that rehabilitation centres be established in the bigger towns, and the council had already decided in principle that such centres must be established on the Witwatersrand and in Cape Town. An experimental centre for 30 persons would be erected at a low cost at the labour factory at Springfield, Johannesburg. The cases—all of them orthopaedic cases—would require treatment for a maximum period of 6 months. Everything about them, their disabilities, production capacity and past history, would be recorded. In this way it would be possible to determine exactly what could be done and what it would cost to rehabilitate a defective person to such an extent that he could earn his own living again.

## TO RESTORE SELF-CONFIDENCE

Should the experimental scheme be a success, the idea would be to go ahead on a bigger scale and give disabled persons treatment in the larger industrial centres. The purpose of the rehabilitation centres would be to restore the self-confidence of defective persons, to make them physically fit, to determine their potentialities, and to give them advice regarding their future occupations. In this way it would be possible to place a large number of defective persons in employment and disability grants and other pensions would gradually disappear.

The Minister concluded by emphasizing that what was needed was not pity but the correct approach to the problem so that disabled persons could again become independent and self-reliant.

## POLIOMYELITIS

BY OUR PARLIAMENTARY CORRESPONDENT

During 1956 there were altogether 1,422 cases of poliomyelitis among Europeans in the Union—1,194 among Natives, 246 among the Coloured population and 56 among Asiatics. This was stated by the Minister of Health, Mr. J. H. Viljoen, in the House of Assembly last week when replying to a question.

The Minister said that in 1957 up to and including 27 February the incidence of poliomyelitis was Europeans 583, Natives 371, Coloureds 166 and Asiatics 24.

Since the Poliomyelitis Foundation commenced production of polio vaccine, 1,384,000 doses had been prepared but a considerable quantity of this was still in the various stages of being tested.

Mr. Viljoen said 33,700 doses had to be destroyed by the Foundation because it had been methiolated and ampouled before the

unfortunate incidents occurred in the United States, and could therefore not be re-tested.

The Department of Health had not sent a circular to local authorities inviting them to state their vaccine requirements, but at the request of his Department such a circular was sent to local authorities by the Poliomyelitis Research Foundation. By the appointed date, applications for 368,600 doses of vaccine were received, including applications by private practitioners. The Minister said that the circular was not sent to private practitioners because the procedure to be followed by medical practitioners desirous of obtaining supplies of vaccine for their patients was explained in detail by his predecessor in national broadcasts and press statements.

## RECENT ACCESSIONS TO THE MEDICAL LIBRARY, UNIVERSITY OF CAPE TOWN

*Gertler, Menard M. and Paul D. White.* Coronary heart disease in young adults. Harvard U.P., 1954.  
*Johns Hopkins university.* McCollum-Pratt institute. A symposium on amino acid metabolism. Johns Hopkins press, 1955.

*Paterson, D. G. and G. H. Newns.* Modern methods of feeding in infancy and childhood. 10th ed. Constable, 1955.  
*Browne, F. J. and J. C. M. Browne.* Antenatal and postnatal care. 8th ed. Churchill, 1955.  
*United nations.* W.H.O. Infant metabolism. MacMillan, 1956.

- Clark, W. E. Le G. The fossil evidence for human evolution. Chicago U.P., 1955.
- International congress on Vitamin E, 3rd, Venice, 1955. Vitamina E. Valdonega, 1956.
- Wakley, Sir C. P. G. Aids to surgical diagnosis. 3rd ed. Baillière, Tindall & Cox, 1954.
- McLaggan, J. D. and J. Collier. Diseases of the ear, nose and throat. 2nd ed. Lewis, 1952.
- Waddington, C. H. Principles of embryology. Allen & Unwin, 1956.
- Davidson, L. S. P. The principles and practice of medicine. 2nd ed. Livingstone, 1954.
- Edwards, P. R. and W. H. Ewing. Identification of enterobacteriaceae. Burgess, 1955.
- Hingson, R. A. and L. M. Hellman. Anesthesia for obstetrics. Lippincott, 1956.
- Davson, H. Physiology of the ocular and cerebrospinal fluids. Churchill, 1956.
- Winton, F. R. editor. Modern views on the secretion of urine. Churchill, 1956.
- Werner, S. C. editor. The thyroid. Hoeber-Harper, 1955.
- Garrison, F. H. and L. T. Morton. Medical bibliography. Grafton, 1954.
- Hammond, R. J. Food. H.M.S.O., 1951, 1956. 2 volumes.
- Lancet. Disabilities and how to live with them. Lancet Ltd., 1952.
- Waters, R. M. editor. Chloroform: a study after 100 years. Wisconsin U.P., 1951.
- Britton, H. T. S. Hydrogen ions. v. 1. 4th ed. Chapman & Hall, 1955.
- Robinson, J. R. Reflections and renal functions. Blackwell, 1954.
- Adriani, J. Selection of anesthesia. Thomas, 1955.
- Foot, R. R. Varicose veins. Butterworth, 1949.
- Romer, A. S. Man and the vertebrates. 3rd ed. Chicago U.P., 1953.
- Hershenson, B. B. Obstetrical anesthesia. Thomas, 1955.
- London. University. British postgraduate medical federation. Lectures on the scientific basis of medicine. Vol. 4, 1954-55. Athlone press, 1956.
- Trueta, J. and others. Handbook on poliomyelitis. Blackwell, 1956.
- Cole, W. H. Operative technic. 2nd ed. Appleton-Century-Crofts, 1955-56.

## NEW JOURNAL 'REHABILITATION IN SOUTH AFRICA' : NUWE TYDSKRIF 'REHABILITASIE IN SUID-AFRIKA.

The Department of Labour, on the recommendation of the South African Rehabilitation Council, is issuing a journal to be known as 'Rehabilitation in South Africa' which will deal with the subject of rehabilitation and the employment of persons with physical and mental handicaps. The first issue is at present being printed.

This magazine will be sent to all specialists whose work is concerned with rehabilitation, as well as all hospitals and full-time district surgeons. Should any other medical practitioners wish to receive the journal, it may be obtained free on application to the Secretary of Labour, Private Bag 117, Pretoria.

Die Departement van Arbeid gaan, op aanbeveling van die Suid-Afrikaanse Rehabilitasieraad, 'n tydskrif uitgee wat bekend sal staan as 'Rehabilitasie in Suid-Afrika' wat sal handel oor die onderwerp van rehabilitasie en die indiensneming van persone met fisiese en geestelike belemmerings. Die eerste uitgawe is tans op die pers.

Hierdie tydskrif sal gestuur word aan alle spesialiste wie se werksaamhede rehabilitasie raak, asook aan alle hospitale en voltydse distriksgeneesher. Indien enige ander mediese praktisyns verlang om die blad te ontvang, kan dit op aanvraag kosteloos verkry word van die Sekretaris van Arbeid, Privaatsak 117, Pretoria.

## OFFICIAL ANNOUNCEMENT : AMPTELIKE AANKONDIGING

### MEDICAL AID SOCIETIES : TRAVELLING FEES

The attention of practitioners is drawn to the fact that most medical aid societies do not grant any benefits to their members on travelling fees charged by doctors. A few societies grant benefits on travelling fees while some societies collect the amount due to the doctor from the member, but in the majority of cases the society does not hold itself responsible for these fees, which should be collected from the member by the doctor himself. This fact should be borne in mind by practitioners when called upon to attend members of medical aid societies or their dependents in cases where travelling charges are involved.

Medical House  
Cape Town  
26 February 1957

L. M. Marchand  
Associate Secretary

### MEDIESE HULPVERENIGINGS-REISKOSTE

Die aandag van geneesher word gevestig op die feit dat meeste mediese hulpverenigings nie enige voordeel aan hulle lede op rekenings vir reisgelde van dokters skenk nie. 'n Paar verenigings gee toekennings terwyl sommige ingewillig het om die bedrag wat aan die dokter verskuldig is van die lid in te vorder, maar in meeste gevalle is die vereniging nie vir hierdie gelde verantwoordelik nie en moet dit deur die dokter van die lid ingevorder word. Geneesher moet hierdie feit in gedagte hou wanneer hulle na lede van hulpverenigings of hulle afhanklikes geroep word en daar reiskoste by betrokke is.

Mediese Huis  
Kaapstad  
26 Februarie 1957

L. M. Marchand  
Medesekretaris

## NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

Surital—A New Anaesthetic. Parke Davis Laboratories (Pty.) Ltd. announce the introduction of Surital (thiamylal sodium)—an ultra-short-acting intravenous anaesthetic—and submit the following particulars:

Surital is the thio-analogue of the barbiturate secobarbital just as thio-pentone is the thio-analogue of pentobarbital. Surital is used both intravenously and rectally. The action is characterized by smooth, rapid induction, early recovery, and few complications.

Some workers<sup>1-3</sup> have found Surital to be more potent than thiopentone, with a shorter duration of action, and it would appear that the main advantage of intravenous Surital over thiopentone is the shorter recovery period together with the greater hypnotic action.

Disadvantages of similar anaesthetic drugs in the past have been the hyperactivity of laryngopharyngeal reflexes and the excessive respiratory depression in the anaesthetic stage resulting

from the  
towards  
minima  
Surital  
or in c  
ary a  
ducti  
region  
rapid r  
of out-  
theatre

Dosage  
1. S  
as for  
Surital  
and th  
penton  
2. S  
general  
or hys  
patient  
admini  
dosage  
per 100  
a 5% s  
thetia  
is 2 g.

Contra-  
Cont  
turate.  
diseases

Packag  
Surital  
Surital  
are Me

1. Ba  
24,

Union  
ended 2  
Plagu  
Epidem  
Plagu  
Chole  
Dakka  
Small  
Phnom-  
Calcutta  
cherry,  
Tjirebon  
Chalna,  
Typhu  
Typhu

South A  
Cape To  
will be  
Theatre,

Psychol  
Doc  
M.F.  
195  
Liver-Fl  
F.R.  
H.



from their use. It is therefore particularly significant that tendencies towards laryngospasm and depression of respiration appear minimal with Surital.<sup>4,5</sup>

Surital may be used both intravenously and rectally, either alone or in combination with general and local anaesthesia. As a secondary agent its usefulness has been demonstrated in assisting in the induction of general anaesthesia and in covering most types of regional analgesia. Because of the short duration of action and rapid recovery of consciousness Surital has a place in the treatment of out-patients, and is useful for short operations in the operating theatre.

#### *Dosage and Administration*

1. *Surital Intravenous.* Patients are prepared in the same way as for any general anaesthetic, with suitable premedication. Surital may be combined with any other anaesthetic or relaxant and the rate of injection is similar to that employed with thiopentone, the initial dose being on an average 300-350 mg.

2. *Surital Rectal.* The patient should be prepared as for a general anaesthetic and the stomach should be empty. Atropine or hyoscine should be given as a premedication and in very nervous patients or those with a high metabolic rate it is advisable to administer Omnopon or Pethidine as well. The recommended dosage of Surital Rectal for pre-anaesthetic sedation is 1.33 g. per 100 lb. body-weight, which is the equivalent of 0.266 c.c. of a 5% solution per lb. body-weight. The dosage for basal anaesthesia is 0.4 c.c. of a 5% solution per lb. of body-weight, which is 2 g. per 100 lb. body-weight.

#### *Contra-indications*

Contra-indications to the use of Surital are those of any barbiturate. Rectal administration is contra-indicated in patients with diseases of the rectum or loss of control of the anal sphincter.

#### *Package*

Surital Intravenous is supplied in ampoules of 0.5 g. and 1.0 g.; Surital Rectal is supplied in ampoules of 1.5 g. The distributors are Messrs. Lennon Ltd.—all branches.

1. Barlow, M. B. and Ginsberg, H. (1956): S. Afr. Med. J., 24, 560.

2. Phillips, H. S. (1953): Anesth. Analg., 32, 56.
3. Stephen, C. R. and Martin, A. (1951): N. Carolina Med. J., 12, 501.
4. Helrich, M., Papper, E. M. and Rovenstine, E. A. (1950): Anesthesiology, 11, 33.
5. Clarke, M. T., Walton, C. H. and Bowersdorf, H. L. (1952): Anaesth. Analg., 31, 73.
6. Helrich, M., Daly, J. F. and Rovenstine, E. A. (1950): Pediatrics, 6, 25.

\* \* \*

*Covatin, a new Tranquillizer.* Messrs. Warner Pharmaceuticals (Pty.) Ltd., 6-10 Searle Street, Cape Town, announce as follows:

Covatin is a new anti-anxiety drug with spasmolytic properties, promoting tranquillity and release from tension, without inducing sleep or dulling of alertness. The chemical formula is p-butylthiodiphenylmethyl-2-dimethylaminoethyl sulphide hydrochloride.

Covatin has a sedative action which relieves tension, reduces nervousness and provides tranquillity without producing any tendency to drowsiness. It is remarkably free from side-effects, and no reports have been received of side-effects necessitating discontinuation of the drug. It is not-habit forming.

#### *Indications*

Covatin is indicated in all cases where sedation is required, such as nervousness, agitation, anxiety and minor neuroses. It is also used with success in combination with analgesics in psychiatry, cardio-vascular diseases, and gastro-intestinal disturbances.

#### *Contra-indications*

Covatin is contra-indicated in coma due to central nervous depressants such as alcohol, barbiturates or opiates, since Covatin exerts its sedative effect by depressing the central nervous system.

#### *Dosage*

The therapeutic dose of Covatin is one tablet 5 times daily, which should be taken with food, if possible.

Covatin is available as 50 mg. sugar-coated tablets in bottles of 100 and 500.

## PASSING EVENTS : IN DIE VERBYGAAN

*Union Department of Health Bulletin.* Report for the 14 days ended 21 February 1957:

*Plague, Smallpox, Typhus Fever:* Nil.

*Epidemic Diseases In Other Countries.*

*Plague:* Nil.

*Cholera* in Calcutta, Madras (India); Chalna, Chittagong, Dakka (Pakistan).

*Smallpox* in Kabul (Afghanistan); Akzab, Rangoon (Burma); Phnom-Penh (Cambodia); Ahmedabad, Allahabad, Bombay, Calcutta, Cuddalore, Delhi, Kanpur, Lucknow, Madras, Pondicherry, Quilon, Tiruchirappalli, Visakhapatnam (India); Makassar, Tjirebon (Indonesia); Baghdad, Basra, Mosul (Iraq); Kuwait, Chalna, Chittagong, Dacca, Karachi (Pakistan); Kisumu (Kenya).

*Typhus Fever:* Nil.

*Typhus Fever* in Kabul (Afghanistan); Cairo (Egypt).

\* \* \*

*South African Paediatric Association.* The next meeting of the Cape Town Sub-group of the South African Paediatric Association will be held on Tuesday, 12 March 1957 in the E Floor Lecture Theatre, Groote Schuur Hospital, Cape Town, at 8.15 p.m.

The speaker for the evening will be Dr. Karl Konig, M.D., who is the Superintendent of the Camphill Rudolf Steiner Schools, Scotland, and Chairman of the Sheiling Curative Schools, England. His subjects will be 'The Various Types of Handicapped Children, their Schooling and their Training'. Immediately after this address the Annual General Meeting of the Sub-group will be held.

\* \* \*

*South African National Tuberculosis Association.* On 23 February 1957 the Mat de Jager SANTA Tuberculosis Centre at Beaufort West, Cape Province, was officially opened by Dr. R. J. Smit, Chief Regional Health Officer, Cape Town. This centre is SANTA'S 17th settlement, and was built to accommodate 80 non-European patients. The first patient was admitted on 1 November 1956.

\* \* \*

*South African Society for Industrial Health,* Cape Sub-group. Prof. R. Turner, Senior Government Pathologist, will give a talk on Poliomyelitis Immunization in the Senior Men's Common Room, Medical School, Observatory, Cape, at 8 p.m. on Wednesday, 13 March 1957.

## BOOKS RECEIVED : BOEKE ONTVANG

*Psychology, Religion and Human Need.* A Guide for Ministers, Doctors, Teachers and Social Workers. By W. L. Carrington, M.D. Pp. xi + 315. 30s. net. London: The Epworth Press, 1957.

*Liver-Fluke Snails in Britain.* By Alan Mozley, D.Sc., Ph.D., F.R.S.E. Pp. xii + 55. 11 Illustrations. 9s. net. London: H. K. Lewis & Co Ltd. 1957.

*Positioning in Radiography.* Seventh Edition. By K. C. Clark, M.B.E., F.S.R. Pp. 655 with 2,150 illustrations. 105s. London: Wm. Heinemann (Medical Books) Ltd. 1956.

*An Atlas of Anatomy.* Fourth Edition. By J. C. Boileau Grant, M.C., M.B., F.R.C.S. (Edin.). Pp. xii + 554 with 714 illustrations (many in colour) in 634 figs. 120s. net. London: Baillière, Tindall and Cox Ltd. 1956.

## REVIEWS OF BOOKS : BOEKRESENSIES

## ELECTROCARDIOGRAPHY

*An Introduction to Electrocardiography.* By L. Schamroth, M.B., B.Ch. (Rand), M.R.C.P.E., F.R.F.P.S. Pp. xi + 60. 106 Figures. 21s. Cape Town and Johannesburg: Juta and Co. Limited. 1956.

**Contents:** Foreword by Prof. G. A. Elliott. Preface. 1. Basic Principles. 2. Myocardial Death Injury and Ischaemia. 3. Bundle Branch Block. 4. Ventricular Hypertrophy. 5. Digitalis and Potassium Effect. 6. Disorders of Cardiac Rhythm. General Observations. Appendix: Elementary Electrophysiology. Index.

In this booklet the author attempts to present to the student the complicated subject of clinical electrocardiography in as simple a way as possible. The common patterns occurring in cardiac infarction, bundle-branch block and ventricular hypertrophy, are summarily dealt with and the basic patterns illustrated. The origin of the abnormal patterns is well shown diagrammatically. The common arrhythmias are included in this survey, but the diagrams are unconventionally illustrated.

As its name indicates the book is nothing more than an introduction to its subject; and in this capacity it may serve for the beginner. It can be read in an hour or two.

V.S.

## PHYSIOLOGY

*Medical Physiology.* Tenth Edition. Edited by Philip Bard. Pp. xxiv + 1421. 438 Illustrations (5 in color). South African Price £5 19s. St. Louis: The C. V. Mosby Company. 1956.

**Contents:** Part I. *The Circulation.* By H. C. Bazett and Philip Bard. 1. The Blood. 2. Coagulation of the Blood (By C. Lockard Conley). 3. General Outline of the Circulation. 4. The Heart. 5. The Heart as a Pump. 6. Cardiac Output. 7. Elasticity of Arteries and Resistance to Flow in the Arterial System. 8. Pressure and Flow in the Arteries. 9. Vasomotor Control of the Arteries and Arterioles. 10. The Circulation in the Capillaries and Veins. 11. The Regulation of the Systemic Circulation. 12. Lymph. 13. The Pulmonary Circulation and the Respiratory Variations in the Systemic Circulation. 14. The Blood Supply of Special Regions. 15. Blood Volume, Haemorrhage and Shock (By Magnus I. Gregersen). Part II. *The Respiration.* By Carl F. Schmidt. 16. The Mechanics of Respiration. 17. The Gas Exchange in the Lungs. 18. The Transport of the Respiratory Gases by the Blood. 19. The Respiratory Center: Its Location, Organization and Activation. 20. The Reflex Regulation of Respiration. 21. The Interplay Between Nervous and Chemical Factors in the Regulation of Respiration. 22. Abnormal Types of Respiration. 23. Anoxia. 24. Poisonous Effects of Nitrogen, Oxygen and Carbon Dioxide. Part III. *The Physiology of the Alimentary Tract.* By E. S. Nasset. 25. The Ingestion of Food. 26. Digestion in the Mouth. 27. Deglutition, the Cardiac Sphincter, Vomiting. 28. Gastric Juice. 29. Digestion in the Stomach. 30. Muscular Movements of the Stomach. 31. Secretions in the Small Intestine. 32. Digestion in the Small Intestine. 33. Absorption From the Small Intestine. 34. The Movements of the Small Intestine. 35. The Colon. Part IV. *Metabolism and Nutrition.* By Chalmers L. Gemmill. 36. Introduction and Methods. 37. Energy Metabolism. 38. Tissue Metabolism. 39. The Metabolism of Carbohydrates. 40. The Control of Carbohydrate Metabolism. 41. The Chemistry of Muscular Contraction. 42. General Protein Metabolism. 43. Special Metabolism of Proteins. 44. The Metabolism of Lipids. 45. Vitamins. 46. Nutrition: Food Requirements and Inorganic Salts. 47. The Physiology of Muscular Exercise. 48. Body Temperature Regulation (By Philip Bard). Part V. *The Distribution and Regulation of Body Fluids.* By Magnus I. Gregersen. 49. Total Body Water and the Fluid Compartments. 50. Total Water Balance; Thirst, Fluid Deficits and Excesses (with L. J. Cizek). 51. The Kidney. Part VI. *The Endocrine Glands.* By R. G. Hoskins. 52. Hormones in Physiology. 53. The Thyroid Gland. 54. The Parathyroid Glands. 55. The Adrenal Glands. 56. The Hypophysis or Pituitary Gland. 57. The testis. 58. The Ovary. 59. Endocrine Factors in Reproduction. 60. Pineal, Thymus and Other Possible Endocrine Organs. Part VII. *The Neuromuscular System.* By Howard J. Curtis. 61. Electrical Excitation and the Relation of Stimulus to Response. 62. Conduction in Nerve and Muscle. 64. Smooth Muscle. 65. Nerve. 66. Transmission of Excitation at the Neuromuscular Junction. Part VIII. *The Central Nervous System.* By Philip Bard. 67. Receptor Organs and Discharges in Sensory Nerves. 68. Discharges in Motor Neurons. 69. Synaptic Transmission (By Vernon B. Mountcastle). 70. The Reflex Activity of the Spinal Cord (By Vernon B. Mountcastle). 71. Postural Coordination, Locomotion and Their Central Control. 72. The Cerebellum (By Elwood Henneman). 73. The Autonomic Nervous System or the Efferent Pathways to Visceral Effectors. 74. The Hypothalamus. 75. The Sensory Centres of the Brain. 76. The Motor Functions of the Cerebral Cortex and Basal Ganglia. 77. Some Further Analyses of the Functions of the Cerebrum. Part IX. *The Special Senses.* By J. M. D. Olmsted. 78. The Eye as an Optical Instrument. 79. Physiology of the Retina. 80. Eye Movements. 81. The Ear and Hearing. 82. Chemical Senses. References.

This text-book first appeared in 1918 with the title *Physiology and Biochemistry in Modern Medicine*. In its early editions the author, J. J. R. Macleod, concentrated on those aspects of physiology and biochemistry which were most obviously applicable to the practice of medicine. In later editions the scope of the book was expanded to make it acceptable also to pre-clinical students, and other authors added their contributions. The last 3 editions have been written by teams of eminent American physiologists and edited

by Professor Bard of Johns Hopkins University. Biochemistry, now regarded by many as a separate science, is dealt with less fully than physiology, and the present title, *Medical Physiology*, appropriately indicates the content of the 10th edition.

Although the book now purports to be a text-book of physiology suitable for medical students, its strength still lies in its treatment of applied physiology. As a general text-book it is too uneven. The subject of reproduction is hardly mentioned and the sections on neuromuscular activity, on blood coagulation, and on endocrinology, are at a rather elementary level; in contrast, the physiology of respiration and of the central nervous system is dealt with in considerable detail. There are some surprising omissions; Prinzmetal's work on the mechanism of atrial flutter and fibrillation is ignored and, in the endocrinology section, there is no mention of aldosterone or of glucagon.

A book of this size and price must be uniformly excellent to hold its own against the many others in this highly competitive field. In spite of its distinguished authorship and its detailed exposition of many important aspects of the subject, Bard's *Medical Physiology* is, on the balance, disappointing.

A.W.S.

## SURGERY

*Surgery for General Practice.* By Victor Richards, M.D. Pp. 947. 476 Illustrations. £7 8s. 9d. St. Louis: The C. V. Mosby Company. 1956.

**Contents:** 1. Local Anesthesia. 2. Hemorrhage, Blood Replacement, Blood Substitutes, Shock. 3. Injury: Surgical Adjuncts. 4. Infection and Chemotherapy in Surgery. 5. Chronic Infections. 6. Anticoagulants: Venous Thrombosis: Pulmonary Embolism. 7. Burns. 8. Skin Grafting. 9. Plastic Surgery. 10. Ear, Nose and Throat. 11. Visible and Palpable Tumours of Soft Parts. 12. Mouth, Oropharynx, Lip, Jaw, Tongue. 13. Parotid and Salivary Glands: Surgery of the Facial Nerve. 14. Neck. 15. The Breast. 16. Chest Disorders. 17. Acute Abdominal Disorders. 18. Anal Canal and Rectum. 19. Urology. 20. Common Gynecologic Problems. 21. Peripheral Vascular Disease. 22. Veins and Lymphatics. 23. Sympathetic Nervous System. 24. Endocrine Problems. 25. Hypertension. 26. The Central Nervous System. 27. Craniocerebral Trauma. 28. Infections of the Central Nervous System. 29. Intractable Pain. 30. Peripheral Nerve Surgery. 31. Surgical Lesions of the Spinal Cord. 32. Injuries to the Spinal Cord. 33. Neurovascular Pain in the Cervicobrachial Area. 34. The Arm and Shoulder. 35. The Elbow. 36. The Wrist and Hand. 37. General Principles of the Surgery of the Hand. 38. Low Back Pain. 39. The Hip. 40. The Knee. 41. The Ankle and Foot. 42. Bone Tumor. 43. Fractures.

In some ways the situation of the medical reader may be described as desperate. Besides the flood of ornate and expensively illustrated books which descends on him there are the medical periodicals. These are lavishly produced on rich glossy paper. They could not survive beyond a single issue if they did not carry even more lavishly produced advertisements extolling the current antibiotic, the fashionable tranquilizer and the hypotensive drug of the hour. The reading matter is for the most part the outcome of the ruthless drive in medical schools, institutes, foundations and associations which impels their staff members to *Publish*. *Publish* or be forever damned! What are your publications? What has he published? How many medical gatherings have had to endure the permutations and combinations of the meagre contribution the desperate man has made? These are the ultimate questions which make or mar a career.

A case can be made for allowing doctors to advertise their merits in the press. The doctor in Florence who has placarded the circular drive which now replaces the ancient walls of the city with advertisements of his skill in the treatment of venereal disease does not need to write articles in medical journals to impress his colleagues, who are thereby spared the necessity of reading them. If all the gastrectomists, cholecystomists, prostatectomists and hysterectomists were allowed to put notices in the press and outside their rooms somewhat as follows: 'Try Mr. H. Under-Cutt FRCS for Billroth I's, 1,000 cases with 1.5% mortality' they would not need to write text-books or articles in the medical press to advertise themselves, and there would be time to read what really needed to be read and we could all go fishing.

These reflections, the reviewer hastens to add, are not prompted by his study of 'Surgery for General Practice'. Here is a book published at £7 8s. 9d. This is a hefty price. Is it worth it? What has it got that other books have not? Its laudable aim is to provide for the general practitioner a bird's-eye view of what the specialists are up to in their own field of work. Some of the chap-

ters are puzzling or ante this con become every The ch particul Regro need for from th to comp

The i tioned Tidy, Walk John

Contents Note. In itioners' Surgical

The Me is older It does during ticular single ground paedic etc.

One poliom steroid the me get a met get a r hormon Simpos surgery

We may be of the is not better

The and pr feels gr are bro

A lis is a val

Anae F.F. £1 1 (Sole 713,

Contents during C IV. Pulm Complie VIII. Co Endotr Side Ac plosions Gas Me dico-

'Consi drugs not me has led

ters are very good and make rewarding reading. It is a trifle puzzling to know just how important the subject of platybasia or anterior subluxation of the assimilated atlas on the axis is in this connection, or how commonly the repair of scaphocephaly becomes a matter of urgency. Nevertheless the more pedestrian, everyday ailments are dealt with clearly and in reasonable language. The chapter on the ear is particularly good, that on the breast particularly bad.

Regretfully it must be said that this book does not replace the need for authoritative monographs. As a compendium it suffers from the defect of all compendia—lack of balance and the need to compress information.

G.S.

## MEDICAL ANNUAL

*The Medical Annual. A Year Book of Treatment and Practitioners' Index. Seventy-Fourth Year 1956. Editors: Sir Henry Tidy, K.B.E., M.A., M.D. (Oxon), F.R.C.P. and R. Milnes Walker, M.S. (Lond.), F.R.C.S. Pp. xl + 548 + 27. Bristol: John Wright & Sons Ltd. 1956.*

*Contents:* Contributors and their Contributions. List of Plates. Publishers' Note. Introduction by the Editors. Review of the Year's Work. The Practitioners' Index: Recent Pharmaceutical and Dietetic Preparations, Medical and Surgical Appliances, Etc. Books of the Year. General Index.

The Medical Annual 1956 is the 74th annual volume. The annual is older than most practicing doctors and is known to most. It does not present so much summaries of articles published during the past year, as reviews of the progress made in a particular field by recognized authorities in this field. In this way a single volume can and does cover a considerable amount of ground and deals with the spheres of Medicine, Surgery, Orthopaedic Surgery, Neurosurgery, Vascular Surgery, Venereal Diseases etc.

One can quickly get an idea of the current concepts on poliomyelitis immunization, the relative values of aspirin and steroid therapy in rheumatoid arthritis, the latest theories on the mechanism of auricular fibrillation, and the pros and cons of methods of treating malignant disease, etc. The reader will get a reasonable idea of the present status of adrenal cortical hormones from the review by Bishop, who replaces Leonard Simpson in the section on endocrinology. The progress made in surgery of the heart and blood vessels is impressive.

We are again reminded that patients with infective hepatitis may be allowed out of bed as soon as they feel well, irrespective of the persistence of jaundice, that fat in the diet of these cases is not contra-indicated and that the uncomplicated cases do better on a high-protein diet.

The volume gives one a panoramic view of the year's progress and present status. It is a form of stocktaking, and while one feels gratified at the forward steps made, the gaps in our knowledge are brought into useful relief.

A list of recent publications and pharmaceutical preparations is a valuable feature.

I.G.

## ANAESTHESIA

*Anaesthetic Accidents. By V. Keating, M.B., B.Ch., D.A., F.F.A.R.C.S. Pp. vii + 261. 13 Figures. South African Price £1 11s. 6d. London: Lloyd-Luke (Medical Books), Ltd. 1956. (Sole Distributors for Southern Africa: P. B. Mayer, P.O. Box 713, Cape Town.)*

*Contents:* I. The Circulation during General Anaesthesia. II. Cardiac Failure during General Anaesthesia. III. General Anaesthesia and Respiratory Function. IV. Pulmonary Complications. V. Intravenous Barbiturates. VI. Neurological Complications of General Anaesthesia. VII. Complications of Local Anaesthesia. VIII. Complications associated with Spinal Anaesthesia. IX. Complications of Endotracheal Anaesthesia. X. The Effects of Position in Anaesthesia. XI. The Side Actions of Relaxants. XII. Infected Anaesthetic Apparatus. XIII. Explosions and Fires due to Anaesthetics. XIV. Safety Precautions for Injections; Gas Machines—Miscellaneous Accidents; Ophthalmic Complications. XV. Medico-Legal Considerations. Index.

'Considering the profound physiological changes initiated by the drugs used in anaesthesia it is surprising that serious accidents are not more common. Familiarity with the work of the anaesthetist has led to an attitude among his professional colleagues which may

be described as nonchalant, and it is easy to forget that the anaesthetic may be a much greater hazard than the operation.'

These prefatory words provide the key to the reason for, and the nature of, this volume, whose rather unusual title conceals a wealth of valuable information, briefly and lucidly presented and very adequately documented. No bare list of accidents, the book provides a modicum of physiological and anatomical background on which to trace the causes of many of the accidents which may occur, often with dramatic suddenness, during general or local anaesthesia.

With only 13 black-and-white figures and as many tables, none of them extensive, in its 260 pages, the price of the book is perhaps a little out of proportion to its intrinsic value. This is regrettable, for the book fills a distinct need and should be read by all anaesthetists and particularly by all surgeons. Accidents are more likely to happen when inexperienced anaesthetists are ministering to the patient. As only about 20% of the anaesthetics administered annually in this country are at the hands of specialists, the chances are 4 to 1 that the surgeon, confronted with a patient whose life and limb are suddenly and accidentally threatened, and an anaesthetist seeking immediate succour, will be very thankful that he has acquired and studied this book.

C.S.J.

## MENOPAUSE

*Women of Forty. The Menopausal Syndrome. By M. E. Landau, M.D., F.R.C.S. Pp. 49. 5s. net. London: Faber & Faber Ltd. 1956.*

*Contents:* I. What is the Menopause? II. The Physiology of the Menopause. III. Symptoms of the Menopause. IV. Disturbances of Mood. V. The Significance of Unusual Uterine Bleeding. VI. Sex Life at the Menopause. VII. Treatment VIII. Employment of Women over Forty. IX. The Later Years.

The author—a mother and a gynaecologist—has written this book to tell other women what they may expect during the menopausal period of their lives and the physiological basis for the symptoms they may experience. She not only discusses the signs and symptoms of the menopause and how they may be treated, but she sets out to show that a woman may begin a new life when she lays down the possibility of motherhood. She describes the happiness that may be obtained in employment, commercial activity, and the large number of interests that are open to the older woman.

Doctors with difficult menopausal patients may find this book of interest and consider it useful reading for such patients.

A.H.T.

## REPRINTED MEDICAL ARTICLES AND LETTERS

*Interesting Cases and Pathological Considerations and a Numismatic Suggestion. By F. Parkes Weber, M.A., M.D., F.R.C.P., F.S.A. Pp. iv + 77. 5 Figures. 18s. 6d. net. London: H. K. Lewis & Co., Ltd. 1956.*

*Contents:* Foreword. I. My Most Interesting Case: Thrombo-Angiitis Obliterans (Buerger's Disease). II. Case of Achlorhydric Anaemia in a Male followed up for 20 years. III. Congenital Developmental Dysplasias of the Skin—also Congenital Developmental Abnormalities of the Haemopoietic System—connected with other Abnormalities of Development. IV. Naevi and Naevoid Conditions. V. A Note on 'Male' and 'Female' Teratomata, Chorioncarcinoma in Males with the Occasional Occurrence of Acute Gynaecomastia. VI. Teratomatous Naevi. VII. Encephalo-Trigeminal Angiomatosis. VIII. Nuchal-Bulbar Haemangiomas and Encephalo-Facial Haemangiomas. IX. The Steiner-Voerner Syndrome. X. Some Lesser Known Diseases Affecting the Lung. XI. A Note on so-called Lymphatic Tuberculosis. XII. A Note on Osteosclerotic Changes due to Chronic Infection or Neoplastic Infiltration, Secondary (Neoplastic) Marble Bones. XIII. A Rare Disease with Features Resembling both Rheumatoid Arthritis and a Lipoid Accumulation. XIV. Polycythaemia Vera. XV. Centrifugally Travelling Non-Thrombotic Phlebitis and Periphebitis of the Limbs of the Tidy Type. Comparison with the 'Mondor Malady'. XVI. Peripheral Hypersensitive Areas for Perception and Evaluation of Neurological and Psychological Stimuli. XVII. Disease at Various Psychic Levels: Psychic or 'Somatic' Diseases. XVIII. A Portrait Medal of Paracelsus. XIX. A Numismatic Suggestion. XX. Emou Thanantos. Index.

In what he terms the evening of his life, F. Parkes Weber has collected into this small volume another assortment of medical oddities. He includes 19 short articles and letters he has published in various medical journals, such as the *Lancet*, the *B.M.J.*, the *Practitioner* and the *Medical Press*. To these he has added a letter written to the President of the Royal Numismatic Society, containing a suggestion to boost the hobby of coin collecting.



Altogether this makes an odd collection of writings, with little binding them one to another. Added to this lack of continuity is a certain abruptness in style, which also does not make for easy reading.

Not all of these articles are exact transcriptions of Parkes Weber's original contributions—to some he has added, while others he has altered in an attempt to make them more complete. The very nature of the subjects, however, does not lend itself to their being neatly rounded off and many of the chapters leave one with a rather frustrating feeling of incompleteness. While the contents of each chapter is absorbing, it but stimulates the reader's interest, without satisfying it, leaving him craving for more details. Further discussion by the author of certain points would have made the book a greater success.

On the whole, then, this collection of 'interesting cases and pathological considerations' is like a book of short stories, of which each one is interesting, but too short—leaving the reader stranded in mid-air.

I.D.H.

## BODY FLUIDS

*Disturbances of Body Fluids.* (Clinical recognition and management of) 2nd Edition. By John H. Bland, M.D. Pp. xvii + 522. \$11.50. Philadelphia & London: W.B. Saunders Company, 1956.

*Contents:* Glossary of Abbreviations. Consideration of the Problems of Nomenclature in Water and Electrolyte Metabolism and Hydrogen Ion Control. 1. Introduction. 2. Basic Physiologic Considerations of Body Water and Electrolyte. 3. Basic Physiologic Considerations of Hydrogen Ion Control. 4. Pure and Mixed Water and Sodium Depletion: Clinical Concepts of Acidosis and Alkalosis: Edema: Correlation of Clinical and Chemical Pictures, Bedside Observations. 5. Water and Electrolyte Metabolism in Congestive Failure of the Circulation. 6. Body Water and Electrolyte Deviations in Diseases of the Liver. 7. Water and Electrolyte Metabolism in Pediatric Patients in Health and Disease. 8. Water, Electrolyte and Hydrogen Ion Alterations in Pulmonary Disease. 9. Metabolic Changes Peculiar to the Aging and Aged: Diagnosis and Treatment. 10. Surgical Metabolism. 11. Metabolic Aspects of Renal Disease. 12. Adverse Effects of Heat on Body Water and Electrolyte. 13. Water, Electrolyte and Hydrogen Ion Abnormalities in Diabetes Mellitus. 14. Water and Electrolyte Metabolism in Acute and Chronic Adrenal Cortical Insufficiency. 15. ACTH, Cortisone, Hydrocortisone, Doca, Aldosterone: Metacortandracin: Metabolic Effects. 16. Metabolic Consequences of Head Injury and Central Nervous System Disease. 17. Behaviour of Body Water and Electrolyte in Shock, Burns, Crush and Blast Injury, Roentgen Irradiation and Exposure to Cold and other Physical Stress. 18. Normal and Abnormal Potassium and Magnesium Metabolism. Index.

Tyro and doyen alike must have felt that gaining a knowledge of electrolyte physiology is a towel-around-the-head affair, and there have been few books to ease the task substantially. Dr. Bland in this book comes very near to making the job an easy one, but does not quite succeed. His information is accurate and very comprehensive with an extensive bibliography, and there is scarcely an aspect of electrolyte disorder that does not receive adequate discussion.

If the work is not as successful as the quality of the contents should make it, it is owing to the pedantic way in which it is written. The facts lose much of the crisp presentation so desirable in this field by being buried in a haze of epigram, colloquialism and redundant phraseology. Many of the diagrams bewilder, particularly those that depict ideographic little men opening taps and walking treadmills.

The book follows the pattern of many contemporary works in giving a full account of the normal physiology and interpreting abnormal syndromes in this light. The section dealing with tubular mechanisms for bicarbonate reabsorption, urine acidification and cation conservation is a joy to read, and is illustrated with diagrams of unusual clarity.

As the book was intended mainly for the clinician, the clinical description of the various syndromes is pleasantly full and should be of immense use to the practising doctor in planning investigation and therapy. The therapeutic section is based on sound physiological argument and embraces all the contemporary advances. A principle that is implied in this section, but not succinctly enough stated, is that the human body is capable of dealing in most instances with slight excesses or deficits in treatment and does not demand micro-accuracy in the treatment of electrolyte syndromes.

The good features of the book make it highly commendable as an authoritative and practical review.

E.B.D.

## DERMATOLOGY OF CHILDREN

*Practical Pediatric Dermatology.* By Morris Leider, M.D. Pp. 433. 280 Photographs and 13 Drawings. South African Price £4. 9s. 3d. St. Louis: C. V. Mosby Company, 1956.

*Contents:* I. Basic Science Aspects of Dermatology (With Particular Reference to the Skin of the Infant and Child). II. Principles of Dermatologic Diagnosis. III. Principles of Dermatologic Therapy. IV. Dermatoses Attributable to Physical Causes. V. Dermatoses Caused by Pyogenic Bacteria. VI. Superficial Fungal Infections of the Skin, Hair, and Nails. VII. Dermatoses Caused by Viruses (Exclusive of the Viral Exanthemata). VIII. Zoonoses: Dermatoses Caused by Metazoal ('Animal') Parasites. IX. Dermatoses Based Principally on Allergic Mechanisms. X. Dermatoses Caused by the Mycobacteria (Tuberculosis Cutis, Leprosy). By the Actinomyces and Nocardia (Actinomycosis and Nocardiosis), and by the So-called Deep Fungi (Deep Cutaneous Mycoses). XI. Reciprocal Relationships between Cutaneous Diseases, Other Organ Diseases, and Systemic Diseases. XII. Hereditary, Congenital, Dysplastic, Nevoid, and Neoplastic Processes. XIII. Important Dermatoses not Etiologically Classifiable. XIV. A Miscellany of Minor or Uncommon Dermatoses of Infants and Children. Glossary. A Glossary of Some Common Technical and Lay Words, Terms, and Phrases of Dermatologic Importance.

In his preface the author points out that the incidence of abnormalities of the skin probably accounts for between 10 and 20% of the work of medical practice, general or institutional, and he quotes figures for a paediatric hospital indicating that the paediatric age-group contributes its full share of dermatological patients.

The above summary of the contents of this book indicates the scheme of presentation which has been chosen for a mass of information but gives no indication of the amount of detail and erudition which have been lavished on the text. The word 'practical' in the title is not to be interpreted as an indication that scientific medicine is lacking. And the text is in many chapters summarized in the form of readily assimilated tables. A profusion of excellent photographs, unfortunately still in black and white, illustrate the text.

The author has obviously long been a master of both dermatology and composition and has evidently enjoyed writing the book. He has expended considerable pains on finding phrases which are likely to convey his intentions and at the same time appeal to the literary palate of his readers. And with these he has combined a common-sense point of view which should appeal to the majority of the medical profession who are interested in dermatology of necessity and not from the obsessional angle of the specialist. He makes no bones about his disbelief in diet therapy as a common requirement in treatment and gives a reasoned argument for omitting psychosomatics. Conversely, he is crystal clear on the details of effective treatment where it is known, and frankly admits where such knowledge is still lacking.

These days books are expensive, but for those of us who are not dermatologists and who still need a modicum of dermatological skill, this is a book worth buying. It supplies the answers to our ordinary requirements and indicates what should be referred to the expert. This reviewer thinks highly of it.

F.J.F.

## DIABETIC COOKERY

*The Complete Cookery Book for Diabetics.* By Iris Holland Rogers. Pp. vi + 110. 21 Illustrations. 5s. net. London: H. K. Lewis & Co. Ltd. 1956.

*Contents:* Foreword. Introduction: First lesson in food values: Diabetics who do not take Insulin; Diabetics who do take Insulin; All Diabetics; Proteins and Fats; Conclusion. Hints for Diabetic Cookery. Soups. Fish Dishes. Meat and Poultry Dishes. Savoury Dishes. Salads. Vegetables. Sweet Dishes. Cakes and Scones. Drinks. Jams and Preserves. Sundries. Invalid Meals. 20 Gramme portion Puddings. Weights and Measures. Food Tables.

It is very difficult to do satisfactory cooking without reasonable quantities of fats and with restriction of carbohydrates. Within these limitations the author has managed to devise a series of recipes which make it possible for the chronic diabetic to enjoy his food and at the same time to keep to his diet. The recipes are simple and sensible, and the calorific values are clearly indicated. The book can be recommended to all who have the task of catering for this chronic and irritating disease.

T.S.

## CORRESPONDENCE : BRIEWERUBRIEK

## HEART DISEASE IN PREGNANCY

To the Editor: Dr. Sandler's article<sup>1</sup> in the *Journal* on 26 January 1957 was a praiseworthy attempt to deal with a highly difficult set of problems. The last word on this subject will not be spoken in our lifetime, but I think Dr. Sandler might be a little clearer in his own mind about the place of mitral valvotomy in pregnancy. I should like to refer him to an article<sup>2</sup> which appeared in the *Journal* on 12 June 1954.

Dr. Sandler's most grievous statement is: 'Valvotomy . . . may be done in late pregnancy when cardiac failure persists in spite of adequate medical treatment'. Had Dr. Sandler considered the proposition of my co-authors and myself,<sup>2</sup> namely 'There is no reason to assess a pregnant woman for valvotomy any differently from a non-pregnant woman', he would probably have avoided adding cardiac failure to the list of indications for valvotomy and, moreover, would have found himself in agreement with Paul Wood, whom he quotes as saying that right ventricular failure contra-indicates the operation.

G. R. Crawshaw

Princess Nursing Home  
Esselen Street  
Johannesburg  
25 February 1957

1. Sandler, E. M. (1957): *S. Afr. Med. J.*, **31**, 70.
2. Crawshaw, G. R., v. d. Spuy, J. C. and Wilson, B. H. (1954): **28**, 496.

## SURGICAL TREATMENT OF DUODENAL ULCER

To the Editor: The potentially harmful indictment of partial gastrectomy in your editorial<sup>1</sup> of 22 December 1956 prompts me to submit a summary of the as yet unpublished results of the particular investigation which were regarded by Farquharson<sup>2</sup> as a serious condemnation of this well established surgical treatment of duodenal ulceration. The study, carried out in the Gastro-Intestinal Unit, Western General Hospital, Edinburgh, included the investigation of the acid output in 12 patients with post-gastrectomy jejunal ulceration. Farquharson's questionable interpretation of the data was based on the findings in only one of these patients, and it is surprising that he should consider the results indicative of recovery of the pre-operative capacity of acid secretion by the gastric remnant in patients after gastrectomy, and as evidence in support of his 'back to simple gastro-jejunosomy' crusade. The available evidence appears to support the conclusion 'that patients with a high acid secretion tend to recurrences; not that gastric resection tends to cause high acid outputs'.<sup>3</sup>

Partial gastrectomy, in common with the majority of contemporary operative procedures used in the surgical treatment of duodenal ulceration, has as one of its objects the permanent reduction of acid secretion to a level at which subsequent ulceration is unlikely. It is well known, however, that different patients with duodenal ulcer do not have the same degree of hyperacidity. The acid output following maximal histamine stimulation in a large series of such patients was found to average 34 mEq HCl/hour, with a standard deviation of 17 mEq and an upper level of 91.7 mEq. Hospital patients free of gastro-intestinal disease had an output of  $16 \pm 7$  mEq HCl/hour.<sup>3</sup> A standard (2/3rds) resection carried out on a patient with an output of 90 mEq will obviously leave a gastric remnant with a very much higher acid output than that found after a 'standard' gastrectomy in a patient with an output of say 30 mEq HCl/hour. Indeed the output from gastric remnant in the former may be expected to be similar to the mean acid output of untreated duodenal ulcer patients.

The recent investigation<sup>4</sup> carried out on 12 consecutive patients with proven jejunal ulceration following seemingly adequate gastrectomy revealed a mean acid output of 28.3 mEq HCl/hour—output in 9 of them being of the order found in untreated duodenal-ulcer patients. The highest secretor of them all had an output of 82 mEq HCl/hour, and the acid output in the remaining 8 patients ranged from 19 to 44 mEq. Patients free from recurrent ulceration, when examined within a year after gastrectomy for duodenal ulceration, were found to have a mean reduction of acid secretion to 12.5 mEq—approximately a quarter of the

pre-operative level. The results indicated strongly that the jejunal mucosa, with its inherently low resistance to acid chyme, is particularly liable to ulceration when exposed to a high secretion of acid and pepsin.

The presence of a high acid output in patients after a seemingly adequate resection poses a very important problem, and has indeed been attributed to a complete recovery of the capacity for acid secretion after partial gastrectomy.<sup>2</sup> This provocative presumption cannot be fully justified in the absence of a knowledge of the pre-operative acid output in the particular patient under consideration. The acid output before gastrectomy was available in 2 of the 12 patients investigated. One of them had had an output of 50 mEq following the administration of only 1 mg. histamine acid phosphate (and would presumably have shown an even higher output with maximal histamine stimulation), and secreted 28.3 mEq HCl/hour when jejunal ulceration developed 18 months after gastrectomy. The other had an extremely high pre-operative acid output of 91.7 mEq, and was found to have an output of 38.0 mEq 2 months after gastrectomy—by which time jejunal ulceration was already manifest. The resection in the latter had thus reduced the acid-secreting potential of the stomach by about 54 mEq—a figure which showed good agreement with that estimated from the total number of parietal cells counted in the gastrectomy specimen (Card, Marks and Sircus<sup>5</sup>). These workers showed that a highly significant correlation exists between the acid output and the total number of parietal cells, and it may thus be inferred that the resection included about 60% of the 'parietal cell mass', and that the acid output of the gastric remnant was, in fact, dependent on both the acid output before gastrectomy and the extent of the resection carried out. It is highly probable that the acid output in 11 of the 12 patients with jejunal ulceration merely reflects the differences between these 2 variables.

The remaining patient, however, had the enormous output of 82 mEq HCl/hour, despite 2 gastric resections, and his pre-operative acid output would have had to be at least 160 mEq HCl/hour—an almost inconceivable figure—if this generalization were always applicable. This unusual patient (aet. 35) suffered from virtually constant dyspepsia punctuated by repeated, almost lethal, ulcer haemorrhages since the age of 20—and the course of his illness was hardly, if at all, influenced by gastro-enterostomy and the 2 partial gastrectomies carried out on him. This would suggest that jejunal ulceration developed within days or at most weeks following operation, and may be construed as evidence in favour of the existence of a very high residual acid output after each of these procedures. One cannot, of course, exclude the possibility of parietal cell hyperplasia in the gastric remnant<sup>6</sup> as a contributing cause to the high acid output in a few of the patients who develop jejunal ulceration, but there is certainly no definite evidence for the occurrence of such hyperplasia at the present time. This lone case provided the sole basis for Farquharson's statement that 'in such cases the acid values of the secretion in the gastric remnant were as much as 4 times as high as those obtained from a normal stomach'. The findings in this patient would appear to make it unwise, in the present state of our knowledge, to lay down any hard and fast generalization regarding the cause of the high acid output in all patients with jejunal ulceration after partial gastrectomy. But it is perhaps more hazardous to interpret the findings in this single patient as offering conclusive evidence 'that the capacity for acid secretion—even to an abnormally high degree—can be fully recovered after partial gastrectomy'.<sup>2</sup> The high acid-secreting potential of the gastric remnant in the 2-10% of those duodenal ulcer patients who develop jejunal ulceration after a standard (2/3rds) resection should, for practical purposes, be regarded as the residual acid output following resection of about 60-70% of an initially very large 'parietal cell mass'—and can hardly be considered as a 'serious indictment of partial gastrectomy'. But it does cast severe doubt on the rationale of a 'standard' resection in the surgical treatment of all patients with duodenal ulcer, in whom the acid-secreting potential is known to vary so markedly. Each patient presents a problem of applied gastric physiology, and those in whom acid secretion is very high would appear to require a procedure more extensive than standard gastrectomy to reduce the acid output to a level at which subsequent ulceration is unlikely. This has been satisfactorily achieved by combining standard gastrectomy with bilateral vagotomy,<sup>7</sup> a procedure obviously

preferable to radical (7/8ths) gastrectomy, with its attendant higher operative mortality and undesirable side-effects.

The 90-95% of duodenal-ulcer patients treated by standard (2/3rds) gastrectomy who are entirely satisfied with the results of operation are presumably those in whom resection achieves the reduction of acid output to satisfactory low levels. The combination of vagotomy with a drainage procedure (pyloroplasty or gastro-enterostomy) may yet be shown to provide reasonably comparable results in this type of patient. But there is a limit to surgical conservatism, and it is extremely doubtful whether simple gastro-enterostomy merits any place in the treatment of duodenal ulceration other than 'for the unskilled surgeon on the unfit patient'. This simple operation was rejected because of its failure to stand the test of time, and I would certainly 'run faster than' any surgeon who wanted to cure my duodenal ulcer by merely diverting the unaltered flow of acid chyme away from the duodenal to the even less resistant jejunal mucosa!

I. N. Marks

Fels Research Institute  
Temple University School of Medicine  
Philadelphia 40, Pa.  
USA

22 February 1957

1. Editorial (1956): *S. Afr. Med. J.*, **30**, 1219.
2. Farquharson, E. L. (1956): *Lancet*, **2**, 849.
3. Mes, G. M. (1957): *S. Afr. Med. J.*, **31**, 43.
4. Marks, I. N. (1957): *Amer. J. Gastroent.* (in the press).
5. Card, W. I., Marks, I. N., and Sircus, W. (1956): Scientific Exhibition, International Congress of Gastro-enterology, London, 1956.
6. Card, W. I. (1956): *Proc. Roy. Soc. Med.*, **49**, 509.
7. Johnson, H. D. and Orr, I. M. (1954): *Surg. Gynec. Obstet.*, **98**, 425.
8. Ogilvie, H. (1956): *Lancet*, **1**, 115.

#### POLIOMYELITIS RESPIRATOR CASES

*To the Editor:* There are certain points in Dr. L. Kaplan's letter to the *Journal* of 23 February 1957<sup>1</sup> upon which I would like to comment.

First, with regard to tracheotomy in poliomyelitis cases, it is agreed that where permanent marked impairment of respiratory muscles is present, particularly the abdominal muscles used for effective coughing, great difficulty may be experienced in weaning the patient from the tracheotomy. This factor alone makes it important that tracheotomy should not be resorted to lightly. There are cases, however, where I feel that tracheotomy with a cuffed tube provides the only adequate means of dealing with secretions.

Dr. Kaplan states that in tank respirators 'the suction within the tank is simply regulated so as to produce an inspiratory phase sufficient to produce adequate ventilation' and seems to imply that a 'deadly irresistible suction' is thus avoided. I agree that this is so in patients with intact swallowing and laryngeal mechanism but submit that, in the patient who cannot swallow or close his larynx, suction sufficient to provide adequate ventilation is indeed irresistible and can defeat even the most energetic and constant efforts on the part of attendants to remove secretions from the pharynx. In these cases cuffed tracheotomy tube can be life-saving. Salivary secretions may not be deadly at once if inhaled but, once they are inhaled, they become inaccessible in the patient without tracheotomy and who cannot cough, and so may lead to areas of pulmonary collapse and secondary infection which is difficult to deal with in a tank respirator. The very great danger of inhalation of even small quantities of acid gastric contents must also be borne in mind.

Dr. Kaplan gives the impression that a cuffed tracheotomy tube can only be of use for a few hours, after which the cuff must be deflated and its advantage in sealing the trachea is then lost. This is not so. It is true that prolonged continued inflation will lead to pressure necrosis of the tracheal mucosa, but it is only necessary to deflate the cuff on these tubes for 1-2 minutes every 4 hours to prevent this. If this is done regularly and precautions taken to avoid over-inflation, one has seen cuffed tracheotomy tubes fulfil their purpose in sealing the trachea for periods of 4-6 weeks without permanent damage to the trachea. During the short periods during which the cuff is deflated, in patients on intermittent positive-pressure ventilation (IPPV), any secretions which

have collected between the vocal cords and cuff and which cannot be removed by suction from above are blown upwards into the pharynx so that, even during these short periods when the trachea is incompletely sealed off, danger of secretions entering the bronchi is minimal.

While IPPV is not the treatment of choice for all cases of poliomyelitis requiring respiratory assistance, I feel that it is of great value in those cases where both the ventilatory and protective mechanisms of the respiratory apparatus are affected. This need not apply only to poliomyelitis but to other conditions such as acute toxic polyneuritis and also where total paralysis is induced as a therapeutic measure as in some severe cases of tetanus.

With regard to transport of patients with respiratory paralysis I agree with Dr. Kaplan that this is too often effected incorrectly, with disastrous results. I feel that IPPV has a big place here, for it can be simply instituted by use of an inflator, either manual or mechanical, and the use of an anaesthetic facepiece in those cases where glottic function is retained, or by passage of a cuffed endotracheal tube in cases of combined bulbar and spinal paralysis. Used in this way, and properly supervised, transport may be safely effected over long distances to a place where the choice of long-term respiratory method may be made according to the merits of the case.

Finally, I agree entirely with Dr. Kaplan when he says that adequate ventilation is the main essential. Adequate ventilation must, however, be combined with adequate protection of the respiratory apparatus or it may defeat its own purpose.

A. B. Bull

Senior Anaesthetist

Red Cross War Memorial

Children's Hospital

Rondebosch, Cape

25 February 1957

1. Kaplan, L. (1957): *S. Afr. Med. J.*, **31**, 183.

#### POLIOMYELITIS IMMUNIZATION

*To the Editor:* Dr. Freedman's thought-provoking letter<sup>1</sup> of 9 February 1957 is in the opinion of many practitioners and the public most timely. Polio immunization is being urged by the Press, doctors are clamouring for more vaccine, while Cape Town experiences a fairly considerable outbreak of poliomyelitis.

News from the United States about the results of their immunizing campaign at the moment is scant, but we do know that when the Salk vaccine was first introduced polio outbreaks occurred in Idaho (previously polio free) and also some parents of immunized children contracted bulbar poliomyelitis. There was a strong suggestion that a carrier state was in fact being artificially created.

I feel that the time has come to assess the results achieved in this country, and it should not be difficult for the authorities to supply us with the following data:

1. What percentage of inoculated people have contracted poliomyelitis.

2. What number of contacts of inoculated people have contracted the disease.

Personally I feel that until these questions are answered I am unable to inject a potentially harmful virus into my own children and consequently can only advise my patients accordingly. I also feel equally strongly about the possibility of people (including my family) being exposed to an excessive number of artificially created carriers.

I feel that the whole campaign would be more convincing if (as in whooping cough, tetanus and diphtheria immunization) my colleagues could say with confidence that they are certain that the outlook is good, and that the principle of injecting a neurotropic virus, presumably dead, into muscle is good.

If I am misinformed, I should be most grateful if my colleagues would give me guidance and positive information; then I should be happy in the knowledge that the injections were affording genuine protection to my patients and their contacts.

R. D. Heald

'Tristan'

Corner of Kent and Camp Ground Roads

Rosebank, Cape

22 February 1957

1. Freedman, M. P. (1957): **31**, 136.